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THE EVALUATION OF DIAGNOSTIC METHODS IN CARDIAC DISEASE WITH SPECIAL REFERENCE TO ELECTROCARDIOGRAPHY*

By Fredrick A. Willius, M.D.

Section on Cardiology, Mayo Clinic,
Rochester, Minnesota

THE present century has witnessed many notable contributions in the field of medicine. Among these are numerous important diagnostic procedures such as roentgenography, electrocardiography, the determination of arterial and venous blood pressure, circulation time and so forth. While these and various other methods of detection have greatly promoted a wider range of diagnostic possibilities and a greater degree of diagnostic precision, their more general employment has not occurred without certain abuses. Present-day medicine as well as that of the future is seriously threatened by an absurd mechanization unless the advantages, as well as the limitations, of a specific method are thoroughly understood and utilized accordingly. Different diagnostic procedures differ in their order of importance from patient to patient, even under similar pathological circumstances.

While present-day medical teaching must stress the value and importance of the various special diagnostic procedures, one is led to wonder, after close and recurrent contacts with graduate students of medicine, whether the mechanical methods of detection are receiving overemphasis at the expense of the time-tested methods of physical diagnosis. I am inclined to believe that this unfortunate situation has occurred. It is my contention that the basic approach to any and every diagnostic problem is the taking of a *careful clinical history* followed by a *thorough and complete physical examination*. All other diagnostic procedures are, there-

fore, adjuncts, and their employment should be dictated by the peculiar problems and variations of the individual patient.

For example, consider the patient who has rheumatic valvular disease. In this instance the clinical history may or may not admit a previous etiological illness conforming to the requisites of rheumatic fever or chorea and may or may not record symptoms indicating various degrees of cardiac failure. However, the chief evidence is obtained by the careful utilization of the four basic components of physical diagnosis: inspection, palpation, percussion and auscultation. The roentgenogram gives more precise information regarding size of the heart, changes in the configuration of the cardiac silhouette and so forth, but in reality it confirms what has already become quite definite by means of physical methods. The electrocardiogram frequently reveals little or no important information under these circumstances except to classify arrhythmias accurately when they exist.

In contrast with the foregoing example is the patient with the anginal syndrome of coronary sclerosis. Here, the clinical history is frequently the sole evidence on which the diagnosis is based. Physical examination of the heart rarely reveals diagnostic information and the roentgenogram frequently records a normal cardiac silhouette. The electrocardiogram in approximately a third of the cases does not reveal any significant alterations. The electrocardiogram, however, does reveal changes when such complications as previous cardiac infarction have occurred in the not remote past, when left ventricular strain from long-standing hypertension has supervened or other additional cardiac lesions coexist, capable in themselves of producing electrocardiographic abnormalities. The exceptions to the foregoing statement are those cases presenting bundle-branch block of varying degrees.

Another example may be cited displaying evidence wherein the various methods of clinical detection are revealed in still another order of importance. This example comprises cases of

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chronic constrictive pericarditis with or without calcification of the pericardium. Here the history of etiological disease is usually lacking although the history of the onset and development of symptoms may be highly informative. Physical examination of the heart itself is usually unrevealing, although in the final analysis, the lack of cardiac findings becomes very important. However, secondary phenomena are important, such as ascites without corresponding dependent œdema, distension of the jugular veins and the veins of the upper extremities, hepatomegaly, impaired liver function as determined by the sulfobromophthalein hepatic test, and so forth. The roentgenogram reveals a normal-sized cardiac silhouette and unless calcification is demonstrable the evidence thus obtained is only of negative value. However, roentgenoscopy frequently reveals a marked diminution of the amplitude of cardiac excursion. The determination of venous pressure in these cases is of utmost importance, for if venous pressure is not increased, constrictive pericarditis does not exist. This circumstance is the most important indication for the measurement of venous pressure. The electrocardiogram may fail to reveal characteristic changes although diminished amplitude of all waves may occur as well as T wave inversions, at times involving all leads. However, no pathognomonic electrocardiographic pattern exists.

Other similar examples could be cited but those given, I believe, emphasize the issue under discussion. In the final analysis and with deliberate repetition, the fundamental approach to any diagnostic problem, whether it concerns the heart or any other organ of the body, embodies the procurement of a careful history and a complete and thorough physical examination of the entire body. Mechanical diagnostic methods are of great value but are of value only when they are judiciously employed and when their limitations as well as their advantages are fully recognized. Furthermore, the range of normal findings must be fully appreciated regardless of what the diagnostic method may be.

For several years on many occasions, both in writing and by spoken word, I have condemned the customs of certain physicians with regard to their practice of clinical electrocardiography. There was a time when the electrocardiograph was available to a relatively limited group of physicians, and these workers were the pioneers who cautiously and painstakingly investigated

the advantages, as well as the limitations, of the method. Much of their efforts comprised careful correlations of symptoms and of physical and electrocardiographic signs with postmortem study. By this tedious but informative process of investigation the present-day concepts of electrocardiography have been evolved. However, in the last decade, the use of the electrocardiograph has become widespread, owing to the greater availability of equipment, both expensive and cheap, and in this more extended practice, the basic intentions and precepts of the method, in many instances, have been disregarded. These factors are directly responsible for the deplorable situation which exists in many quarters today.

In recent years a new order of being has appeared on the medical horizon, the so-called electrocardiographer. This individual fails to conform to the requisites of the physician and perilously exceeds the limitations of a good technician. He acquires an electrocardiograph and learns the gross departures from the normal graph. He has not, however, learned the fundamental principles of the method, its advantages and limitations under similar circumstances and its range of normal and therefore finds himself in the throes of false optimism and faith. There is also the individual, cloistered in the confines of a laboratory, with little or no interest or experience in clinical medicine, who becomes fascinated by trivia and creates a formulary concept of interpretation. Such a system naturally appeals to the uninitiated owing to its superficial simplicity and apparently infallible comprehensiveness. Such practice is not only dangerous but ridiculous and when accepted by a gullible person leads him hopelessly astray instead of increasing his knowledge of this science. Then finally there is the individual who interests himself in electrocardiography from a purely remunerative standpoint. He may be a champion of the philosophy that no examination, regardless of the patient's complaint, is complete unless an electrocardiogram is made. His position is fortified by the laity, who in their lack of understanding of the science, request this examination with a belief similar to that which they display when dropping a coin in a fortunetelling machine. One of the physician's many trusts is to deter the patient from unnecessary expenditures when he clearly realizes that a special diagnostic examination is not necessary.

The electrocardiographer is not content to concern himself only with the interpretation of the graph before him, but exerts his talents far beyond the boundaries of the science and records a clinical diagnosis. This license is frequently assumed when the interpreter knows nothing regarding the patient's history or physical findings because he has not conducted an examination. Under such circumstances the expression of a clinical opinion is utterly unwarranted and, when rendered, constitutes an absurdity which has regrettably become prevalent and is a destructive influence in clinical electrocardiography.

I have discussed this objection with certain offenders and their invariable reply embodies the excuse that if a clinical opinion is not included the referring physician will not refer any more patients. Such an excuse is not acceptable and clearly indicates the fact that the electrocardiographer has evaded his true mission to his colleagues and to his community. Two alternatives confront him. Either he must create an understanding among his medical associates so that they also realize the limitations as well as the advantages of electrocardiography, or he must permit them to draw their own inferences from his interpretation of the electrocardiogram alone. Any compromise in this attitude is not only fallacious but dangerous.

In recent years significant contributions have been made in the field of electrocardiography in the extension of the pioneer studies, resulting in the recognition of certain graphic forms or patterns which in a large percentage of cases are either characteristic or suggestive of certain pathological entities. Notable in this connection have been the remarkable studies dealing with the identification and localization of cardiac infarcts. Also notable, but less certain, are the changes which at times are exhibited in cases of acute pulmonary infarction. These are but a few examples. However, when these contributions are carefully read it will be found that the various authors emphatically stress the fact that the pattern under discussion does not always occur, that it may be modified under certain circumstances and appear later, that it may be absent in the early course of the disease and so forth. It is further stressed that the clinician at all times must be guided fundamentally by the history, the physical findings and other parcels of evidence which may be available.

Here, again, the uninitiated or the superficially trained, self-sufficient electrocardiographer finds many a pitfall. He searches only for the typical changes which so frequently are absent, resulting in repeated errors not only of omission but also of commission. Once again, the limitations of a valuable method of clinical detection are emphasized.

Another important consideration must be discussed which is not fully appreciated by the clinician who is not interested in the findings after death. This is the fact that in many cases more than one pathological process has contributed to the cardiopathy. Thus, it is extremely common to observe coronary disease associated with hypertension as well as other dual pathological processes. With these facts in mind it can be readily appreciated that the electrocardiograms under varied circumstances are readily capable of losing their anticipated orthodox characteristics because multiple pathological changes obviously interfere with the electric antagonisms of the heart, which when recorded, constitute the electrocardiogram.

Until a time is reached when the fallacious practices that I have mentioned are stopped the science of electrocardiography faces an uncertain future.

RÉSUMÉ

L'électrocardiographie est une méthode diagnostique et pronostique trop souvent utilisée à tort et à travers par des praticiens peu scrupuleux ou mal avertis. On ne doit jamais oublier l'importance de l'histoire de cas et de l'examen physique. Sans ces préliminaires, l'électrocardiographie n'a aucune signification. Il faut également connaître les limitations de cet examen spécial. En général, ce procédé ne sera fait avec profit que par le médecin déjà rompu à la clinique cardiologique dans les cas où il s'agit de confirmer ou d'infirmer un syndrome d'abord bien étudié cliniquement. Il est important de suivre les malades ainsi examinés jusqu'à l'autopsie,—lorsque tel est le cas,—afin de mieux connaître les corrélations entre la clinique, l'examen électrocardiographique et les données anatomo-pathologiques.

JEAN SAUCIER

What a flimsy tissue-paper crown it is which distinguishes us from the animals!—the power to communicate ideas and to contemplate ideals; to be enchanted by a symphony and disgusted by a sound; to be uplifted by a passion and dejected by a doubt; to be divided by a schism and united by an "ism". All this elaborate castle in the air can be blown to shreds by a puff of cyclopropane, and the Machiavelli and the simpleton can be reduced alike to the level of the ox.—*The Lancet*.

IS THERE ANY ADVANTAGE IN
COMBINING SEVERAL EXPECTORANT
DRUGS IN A COMPOUND
COUGH MIXTURE?

By Eldon M. Boyd, M.D., Betty Palmer, B.A.
and Gwen Pearson, B.A.

*Department of Pharmacology,
Queen's University, Kingston, Ont.*

MOST prescriptions written by physicians today contain not more than three or four drugs and often only one. The practice of polypharmacy, so dear to the heart of physicians of bygone days, is gradually passing into the discard, and rightly so. A notable exception to this modern trend is the cough mixture. Whether written extemporaneously by the physician, or contained in the many prescriptions that line the shelves of the drug store, cough mixtures most commonly contain many ingredients, usually a variety of expectorant drugs, with or without an antitussive opiate, in a vehicle which is generally a syrup or combination of syrups. The question arises as to whether or not continuance of this practice is justified. Is there any advantage to be gained in combining several expectorant drugs in a cough mixture?

To begin with, it is essential that the problem be defined clearly and it is this: has the combination of several expectorant drugs any greater expectorant action than the sum of the expectorant action of the individual drugs in the prescription; or, in other words, is there any synergistic expectorant action involved in the combination of several expectorant drugs? Cough may be associated with various other signs and symptoms, and to treat these, various adjuvants and correctives may be added to the cough mixture; this latter practice is perfectly justified, but we are interested only in the expectorant action of the total mixture and of its ingredients.

There are obviously two ways in which the problem may be attacked: first, by taking each expectorant drug and combining it in various doses with various doses of other expectorant drugs, and secondly by investigating the expectorant properties of commonly used cough mixtures and of their several ingredients. In the present investigation, we wish to report upon an investigation of the latter type. For those who may be sceptical about the value of the

cough mixture, it may be pointed out that Boyd and MacLachlan¹ have shown that the expectorant effect of the mixture, camphorated tincture of opium, or paregoric, is greater than the sum of the expectorant effects of its various ingredients, which justifies the continued use of paregoric in cough mixtures. On the other hand, Stevens *et al.*² reported that a single expectorant drug, resyl, has distinct expectorant properties both in animals and man.

The cough mixture which we have investigated was made up as follows:

R
Theophyllinæ Æthylenediaminicæ ... gr. v
Potassii Citratis gr. xl
Vini Ipecacuanhæ min. xl
Chloroformi min. 4/5
Syrupi q.s. ad f 3 j
Fiat mistura
Sig.—Two teaspoonsful in a quarter of a glass of water three or four times a day.

This syrup for cough was kindly provided us by Charles E. Frosst and Company under the name of nusilyn. Since expectorants are usually regarded as drugs which increase the production or excretion of respiratory tract fluid (R.T.F.) and are useful in the treatment of cough, our first studies were upon the effect of this cough mixture upon the output of R.T.F., using animals and the technique which has been worked out in this laboratory for the study of the output of R.T.F.

THE EXPECTORANT ACTION OF THE WHOLE COUGH MIXTURE IN ANIMALS

Albino rats, guinea-pigs, rabbits, dogs, cats and hens were arranged for the collection of R.T.F. after the technique of Perry and Boyd³ as modified by Boyd, Jackson and Ronan.⁴ Briefly, this method consists in lightly anaesthetizing the animals with urethane and collecting R.T.F. through a cannula in the trachea. The tracheal cannula has a side-arm which is connected with an air-conditioning apparatus that warms the inhaled air to body temperature and saturates it with water vapour. R.T.F. is collected in a graduated tube, volume readings are made at intervals of one-half or one hour and the output expressed as ml. per kilo body weight per 24 hours. All exposed parts of the assembly are insulated to prevent condensation of water vapour. Using this equipment, it has been found in this laboratory that most of the commonly used expectorant drugs increase the rate of output of R.T.F. Since R.T.F. may be considered, as part of its functions, to act as a

lubricant toward the lining mucosa of the respiratory passages, it seems logical to conclude that expectorants, by increasing production and excretion of R.T.F., exert a soothing or demulcent action upon this mucosal lining and in this manner relieve coughs which are due to irritation of the mucosa lining the respiratory passages.

During the first hour after the animals have been arranged as above for the collection of R.T.F., the output is usually low, but by the end of the second and third hours it has reached a steady rate which is maintained for several hours and sometimes for two or three days. Hence the cough mixture was given by stomach tube at the end of the third hour in doses of from 0.1 to 10 ml. per kilo body weight. Further readings of the rate of output of R.T.F. were then taken for a period of four hours or longer. In order to have a common denominator for the tabulation of data, the results were averaged hourly after giving the cough mixture and any increase in the rate of output of R.T.F. was expressed as a percentage of the rate of output during the two hours immediately preceding administration of the compound. These data have been summarized in Table I. It may be

TABLE I.
THE EFFECT OF THE WHOLE COUGH MIXTURE UPON THE
OUTPUT OF RESPIRATORY TRACT FLUID

Species	Dose of drug (ml. per kilo)	No. of animals	% increase in output of R.T.F.			
			1st hr.	2nd hr.	3rd hr.	4th hr.
Albino rats.	0.1 to 10	10	223	163	180	183
Guinea-pigs.	0.5 to 10	31	-20	-12	-27	-21
Rabbits....	0.5 to 10	9	-21	-16	-18	-24
Cats.....	0.1 to 10	34	13	44	64	52
Dogs.....	0.5 to 10	10	0	114	71	57
Hens.....	0.5 to 10	9	28	78	51	21

seen that the cough mixture markedly increased the rate of output of R.T.F. in albino rats and similarly but to a lesser extent in cats, dogs and hens, but had no effect (on the average a slight decrease) in guinea-pigs and rabbits. In 4 out of the 6 species, the cough mixture may be considered to have produced an expectorant effect. The failure to obtain an unanimous verdict amongst all the species of animals studied, made it unwise to suggest that the cough mixture would also have an expectorant effect in man, although this was likely. Before drawing the latter conclusion, however, direct experiments in human subjects were indicated. Since it was

impossible to apply to men the technique used in animals, a different procedure was used.

ANTITUSSIVE PROPERTIES OF THE COUGH MIXTURE IN MAN

The cough mixture was given, in the doses stated in the above prescription, to 43 patients with cough due mostly to the common cold, pharyngitis and laryngitis. The patients were seen by one of us (E.M.B.) at intervals of a few days and the number of coughing spells noted by direct observation and by questioning the patient. The numbers of those who, in a day or two, got complete or definite relief from coughing and, secondly, of those with little or no reduction in the number of coughing spells, were noted. In 72% of the patients, the cough mixture gave complete or definite relief from coughing and in 28% it was ineffective.

In an experiment of this nature, it is desirable to have a control group of patients who are given, unknown to them, a placebo mixture which is similar in appearance, taste, etc., to the cough mixture but which does not contain the active expectorant ingredients. Unfortunately, it was impossible to devise a true placebo corresponding to the cough mixture used, because in this cough mixture a syrup was employed as the vehicle. Syrups alone, taken by mouth, have a linctus action and soothe an irritated pharyngeal or laryngeal mucosa, thus allaying cough much in the same manner as sucking a candy or lozenge. Experiments now in progress in this laboratory indicate that syrups alone, taken by mouth, have a brief antitussive effect, but when placed directly in the stomach through a tube, they are not expectorant. One must conclude, therefore, that a part of the immediate antitussive effect of the cough mixture was probably due to the syrupy vehicle but that the more prolonged antitussive effect of the cough mixture was due to its expectorant properties. From the data available, it may be concluded that the cough mixture used was expectorant, and in the case of man antitussive as well, in most patients with cough and in most species of animals.

THE INGREDIENTS OF THE COUGH MIXTURE

In the next experiment, the effect of the various ingredients of the cough mixture upon the output of R.T.F. was determined, and the sum of the individual effects compared with that of the cough mixture as a whole, to see if there was any synergistic action in the combination. Albino rats were selected as the species of ani-

mal to be used and, from dosage studies upon groups of 10 to 15 animals each, a dose of 5 ml. per kilo body weight was finally selected as most suitable. This dose and, separately, the amounts of the various ingredients contained in this dose, were given to groups of albino rats previously arranged for the collection of R.T.F. and the results obtained have been calculated as before. As a control series, syrup was given by stomach tube. The various data obtained have been averaged and given in Table II.

TABLE II.

THE EFFECT OF THE WHOLE COUGH MIXTURE AND OF ITS INGREDIENTS UPON THE RATE OF OUTPUT OF R.T.F. IN ALBINO RATS

Drug	Dose (per kilo)	No. of animals	% increase in output of R.T.F.			
			1st hr.	2nd hr.	3rd hr.	4th hr.
Theophylline ethylenediamine.....	50 mgm.	12	53	29	132	74
Potassium citrate.....	400 mgm.	10	-4	35	21	-14
Wine of Ipecac.....	0.4 ml.	11	29	65	46	80
Chloroform.....	0.01 ml.	10	47	43	49	3
Syrup.....	5 ml.	12	-13	15	4	9
Sum of in- gredients..		55	112	187	252	152
Whole mix- ture.....	5 ml.	36	150	173	181	123

It may be seen that all of the ingredients of the cough mixture, with the exception of the syrupy vehicle, had an expectorant effect. When the percentage increases of the various ingredients were added up, the sum was just about equal to that of the total cough mixture. From this it may be concluded that while the cough mixture is an effective expectorant, there is no synergistic action between the various ingredients in their effect upon the output of R.T.F. Therefore, one might seriously ask if it would not be just as advantageous to prescribe the expectorant ingredients alone, in a suitable vehicle, of course, if a simple cough remedy is desired. With our present limited knowledge of the pharmacological and therapeutic action of expectorant drugs, one cannot state that this is definitely desirable, but the data herein described certainly suggest it. If there is any advantage in the cough mixture studied, our data would suggest that it is due to therapeutic effects of the ingredients other than the expectorant action, and if this be accepted as true, then one might better add these additional correctives and ad-

juvants to suit the particular patient and his or her symptoms and signs.

While we have not had time nor opportunity to investigate other cough mixtures as yet, the information obtained in the present investigation certainly suggests that probably many or most of them could be subjected to the same criticism as we have applied to the mixture studied, that is to say, that while they may be effective expectorant mixtures, there is probably little need of combining many ingredients in the prescription.

THE MECHANISM OF ACTION

To make our story complete, it seemed desirable to investigate the mechanism of action of the cough mixture. To do this, we selected 4 groups of 15 albino rats each. A laparotomy was performed upon the animals of two of the groups and the gastric branches of the vagus nerve severed, thus eliminating these afferent nerve fibres from connection with the stomach and central nervous system. A similar laparotomy was performed upon the animals of the remaining two groups, the intestines and abdominal contents disturbed to approximately the same degree as in the case of animals in the

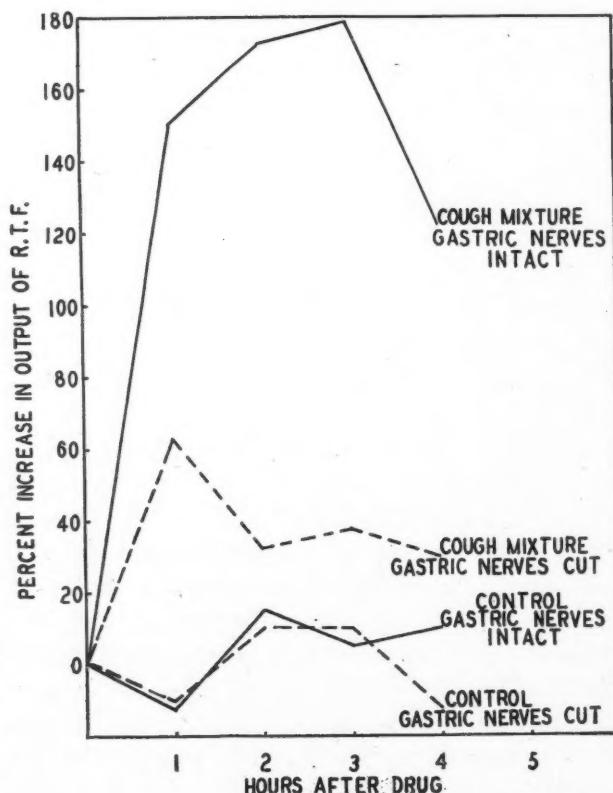


Fig. 1.—The effect of the cough mixture and of syrup as a control given to albino rats with and without the gastric nerves cut, upon the rate of output of respiratory tract fluid.

first two groups, but the gastric nerves were not cut. In all groups, the abdominal wound was then sewed up and the animals arranged for collection of R.T.F. At the end of three hours, the cough mixture was given in a dose of 5 ml. per kilo body weight by stomach tube to animals in two of the groups, one group with the gastric nerves intact and one group with the gastric nerves severed. Animals in the remaining two groups acted as controls and received syrup in place of the cough mixture. Readings were taken, the results averaged and calculated as percentage changes as before. These data are shown in Fig. 1.

From the results obtained, it may be seen that both groups of control animals, given syrup alone, showed no appreciable change in the rate of output of R.T.F. When the gastric nerves were cut, about two-thirds of the expectorant effect of the cough mixture was eliminated, but there was still some increased output of R.T.F. These results suggest the conclusion that the cough mixture acted mostly, but not entirely, through a reflex from the stomach up the vagus nerve to the "expectorant centre" and then down again to the glands of the respiratory tract. A smaller part of the expectorant action of the cough mixture was due, apparently, to a stimulation of the "expectorant centre", or to an action directly upon the secreting cells of the respiratory tract or to some other mechanism.

THE CHLORIDE CONTENT OF R.T.F.

In the above experiments, the only change measured in R.T.F., following presentation of the cough mixture or its ingredients, was the change in volume output. It was possible that changes occurred in the physical or chemical properties of R.T.F. without change in volume, or with it, and while it was not possible to determine all of the properties of R.T.F., it was decided to estimate as an example, changes, if any, in the chloride content. To obtain enough R.T.F. for estimation of its chloride content, samples were pooled (a) for the three hours before giving the cough mixture; (b) for the three hours just after giving the cough mixture, and (c) the samples collected from then on through the night. The results, expressed as mgm. per 100 ml. of R.T.F., were averaged and these data have been given in Table III. While there was some variation, as might be expected, the results did not indicate that the cough mix-

TABLE III.
THE EFFECT OF THE WHOLE COUGH MIXTURE UPON THE CHLORIDE CONTENT OF R.T.F.

Species	Dose of drug (ml. per kilo)	No. of animals	Chloride content of R.T.F. (mgm. per 100 ml.)		
			3 hrs. before drug	3 hrs. after drug	Over night sample
Albino rat...	0 (Control)	12	117	74	99
Albino rat...	0.1 to 10	25	97	71	102
Rabbit.....	0.1 to 10	7	65	43	94
Cat.....	0 (Control)	6	66	34	132
Cat.....	0.1 to 10	31	91	109	127
Dog.....	0.5 to 10	10	48	36	83

ture consistently or significantly affected the chloride content of R.T.F.

The above experiments were performed upon a variety of species of animals. Corresponding experiments were performed upon albino rats alone using the various ingredients in the amount present in 5 ml. per kilo body weight of the cough mixture. The data obtained were treated as above and the results presented in Table IV. Again, there was no evidence that any of the ingredients of the cough mixture significantly affected the chloride content of R.T.F.

TABLE IV.
THE EFFECT OF THE WHOLE COUGH MIXTURE AND OF ITS INGREDIENTS UPON THE CHLORIDE CONTENT OF R.T.F. IN ALBINO RATS

Drug	Dose (per kilo)	No. of animals	Chloride content of R.T.F. (mgm. per 100 ml.)		
			3 hrs. before drug	3 hrs. after drug	Over night sample
Theophylline ethylenediamine.....	50 mgm.	11	92	54	59
Potassium citrate.....	400 mgm.	10	96	49	87
Wine of Ipecac	0.4 ml.	11	120	80	84
Chloroform...	0.01 ml.	10	90	66	106
Syrup.....	5 ml.	12	117	74	99
Whole mixture	5 ml.	10	107	81	106

SUMMARY

Experiments were performed upon a typical cough mixture, containing theophylline ethylenediamine, potassium citrate, wine of ipecac, chloroform and a syrupy vehicle, to see if there was any advantage in the combination with respect to its expectorant properties or more especially its effect upon the volume output of respiratory tract fluid (R.T.F.). Approximately 400 animals were used, including albino rats,

guinea-pigs, rabbits, cats, dogs, hens and also 43 human subjects.

The cough mixture was found to act as an expectorant in most of the animals, in the sense that it augmented the output of R.T.F., and to be antitussive in 72% of patients with cough.

On the other hand, the sum of the effects of the ingredients upon the output of R.T.F. was just about equal to the effect of the whole cough mixture, indicating that no especial advantage could be accredited to this combination of drugs as expectorants.

About two-thirds of the expectorant action of the cough mixture could be attributed to a reflex action from the stomach.

Neither the whole cough mixture nor any of its ingredients had any significant effect upon the chloride content of R.T.F.

The authors wish to acknowledge with thanks the receipt of a grant in aid of this research from Charles E. Frosst and Company of Montreal.

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RÉSUMÉ

Des expériences ont été faites afin de déterminer si la valeur d'une mixture contre la toux est en rapport avec la quantité des ingrédients qui la composent. Ces expériences ont été faites sur des petits animaux et sur 43 humains en évaluant les dosages comparatifs des sécrétions des voies respiratoires. La somme des ingrédients isolés équivaut approximativement,—au point de vue de l'action expectorante,—aux effets obtenus avec la mixture polyvalente. Les deux tiers de l'effet expectorant d'une mixture expectorante peuvent être attribués à un réflexe à point de départ stomacal. La mixture totale et les ingrédients isolés n'affectent en rien le pourcentage des chlorures dans les sécrétions ainsi provoquées. JEAN SAUCIER

In the middle of the eighteenth century botanists thought they had made a new discovery, which they called by a very pretty metaphorical name, the *Sleep of Plants*. This phenomenon, however, was noted as far back as the time of Chaucer, who in his "Legende of Good Women" has the following lines.

"There lovith no wight hartyr alyve,
And when that it is evyn I rynne belyve,
As sone as the sonne ginneth to west,
To see this floure, how it will go to rest,
For fere of night, so hatith darkenes,
Her chere is plainly spread, in brightnesse
Of the sonne, for then it will unclose."

MEDICAL PRACTICE AMONG THE BUSH INDIANS OF NORTHERN MANITOBA*

By Cameron Corrigan, B.Sc., M.D.

Medical Superintendent,
Norway House Indian Hospital, Manitoba

NORWAY House is situated in the northern part of the Province of Manitoba approximately 350 miles north of Winnipeg on the Nelson River. During the summer months there is communication with Winnipeg by water but following the freeze-up in the fall the only communication with outside points is by plane or dog team which makes connection with the Hudson Bay Railway as it runs between The Pas and Churchill. In saying this I have told you much about life in this country. Our biggest problem is one of transportation and communication. Before the war, things were not too bad. We had a weekly plane service, but even with that we had long periods of no communication with the outside, due to the break-up and freeze-up periods. However, planes are scarce here now, except on charter, which is very expensive.

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guinea-pigs, rabbits, cats, dogs, hens and also 43 human subjects.

The cough mixture was found to act as an expectorant in most of the animals, in the sense that it augmented the output of R.T.F., and to be antitussive in 72% of patients with cough.

On the other hand, the sum of the effects of the ingredients upon the output of R.T.F. was just about equal to the effect of the whole cough mixture, indicating that no especial advantage could be accredited to this combination of drugs as expectorants.

About two-thirds of the expectorant action of the cough mixture could be attributed to a reflex action from the stomach.

Neither the whole cough mixture nor any of its ingredients had any significant effect upon the chloride content of R.T.F.

The authors wish to acknowledge with thanks the receipt of a grant in aid of this research from Charles E. Frosst and Company of Montreal.

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RÉSUMÉ

Des expériences ont été faites afin de déterminer si la valeur d'une mixture contre la toux est en rapport avec la quantité des ingrédients qui la composent. Ces expériences ont été faites sur des petits animaux et sur 43 humains en évaluant les dosages comparatifs des sécrétions des voies respiratoires. La somme des ingrédients isolés équivaut approximativement,—au point de vue de l'action expectorante,—aux effets obtenus avec la mixture polyvalente. Les deux tiers de l'effet expectorant d'une mixture expectorante peuvent être attribués à un réflexe à point de départ stomacal. La mixture totale et les ingrédients isolés n'affectent en rien le pourcentage des chlorures dans les sécrétions ainsi provoquées. JEAN SAUCIER

In the middle of the eighteenth century botanists thought they had made a new discovery, which they called by a very pretty metaphorical name, the *Sleep of Plants*. This phenomenon, however, was noted as far back as the time of Chaucer, who in his "Legende of Good Women" has the following lines.

"There lovith no wight hartyr alyve,
And when that it is evyn I rynne belyve,
As sone as the sonne ginneth to west,
To see this floure, how it will go to rest,
For fere of night, so hatith darkenes,
Her chere is plainly spread, in brightness
Of the sonne, for then it will unclose."

MEDICAL PRACTICE AMONG THE BUSH INDIANS OF NORTHERN MANITOBA*

By Cameron Corrigan, B.Sc., M.D.

Medical Superintendent,
Norway House Indian Hospital, Manitoba

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leg gave way under him. No wonder. He had a long spiral fracture. How he stood the pain I don't know, but he claimed it was not very sore. I made a box splint and had the man loaded into the plane, and we were away again. We arrived home that evening and I had still to x-ray and set a leg, apply a plaster cast, and clear up jobs which had accumulated in my absence. It was my habit to let a few cases of elective surgery accumulate, and then have one of my confrères come over from The Pas by plane, and clear it all up between us. Last month he was over, and we did an interval appendix, took out a gall bladder, an ovarian cyst, an old pus tube, and repaired a hernia. This month again we did a Cæsarean section; suspended a retroverted uterus; did a perineal repair; and sutured a quadriceps tendon that had been cut with an axe six months before. To finish off, we did a haemorrhoidectomy after dinner that evening.

What I have described are routine flights or trips. I never go out with the intention of doing anything very much, as there is no one at any place I visit, who can nurse a sick person. Such things as a bad burn; a broken limb; a bad case of pneumonia; a case of tuberculosis; a tuberculous joint, etc., I bring or send back to the hospital. The other day I had word of an Indian getting struck in the eye with a stick while chopping wood. He was 200 miles away. I sent a plane for him, and he was brought in. The eye was punctured; the iris prolapsed; vitreous lost; and the globe partially collapsed. I removed the eye. I take out an eye about once a year.

Every summer in company with the Indian Agent, I visit all the reserves in the agency. While the Agent pays treaty, I carry on a medical practice. I make it my first duty to inoculate and vaccinate everyone in the district. Last year I made up diphtheria toxoid, pertussis vaccine, and typhoid vaccine. Every man, woman, and child got 2 c.c. of this. I had some terrific reactions, and doubt if I will ever use it again. However, I believe it did some good, as we have had no diphtheria, and while other places have had whooping cough epidemics there have been no deaths except in a couple of children born after I had been around, and thus were not inoculated. My next job is pulling teeth, and there are always a lot of these. After that I do what the people want, while there is time. Every place we go I

generally have an obstetrical case. Indeed I have had my most difficult cases on treaty trip, where I have had to work under the poorest conditions. Last summer, I had a frank breach with extended legs and arms, in a dirty old tent with my patient lying on the ground. It is hard on the back, and the only reward is seeing the little toddler next treaty time. A treaty trip takes a month. We see some 4,000 Indians. We keep the plane with us all the time, and if need arises, I return home. I am in constant touch with my hospital by radio. Generally I have to return home once or twice during the course of the trip, either to take a patient to the hospital, or to see about some complication that arises in a patient already in hospital.

Still, the big problem is transportation, and communication. Last week I sent a plane to bring in a patient who was vomiting, and had pain in the abdomen. I was a couple of days getting the wire in the first place, and a couple of days before I could get a plane. The man was dead when the plane called for him. When the war is over, we hope to have better service.

I see a fair number of fractures. In fact I seem always to have a fracture under treatment. At the present I have a hip, a knee, a lumbar spine, and a finger, all in casts. On some I have done resections. I believe the Indian withstands surgery as well as anyone if he is first built up. Axe cuts, gun shot wounds, and frost bites, constitute an important part of this type of practice.

One more trip, and that should be enough. In May I travelled over to Cross Lake by canoe. Ours was the first canoe down the river that spring. There was still ice along the shore. We arrived at Cross Lake in the evening, and immediately a man approached to say his baby was sick with a sore throat. Examination showed a case of diphtheria, far advanced, and a second just starting in another baby in the same house. There were three or four families living in a single roomed house. Obviously something had to be done at once. I could go home for antitoxin, but I could not get cultures done at home at that time, so I decided the best thing was to go out by canoe to the railroad and send throat swabs to Winnipeg, and at the same time, try to get antitoxin. A plane was badly needed this time, but Cross Lake had no radio service. I told my canoeeman to be ready to leave at daylight in the morning,

which at that time of year comes at 3.30 a.m. We got away at 4 o'clock. At 7 o'clock that night I was still 10 miles from the Hudson Bay Railway, but that 10 miles was over a muskeg portage, no road, just muskeg, which had thawed out. I set off with three Indians. Never will I forget that night. Every step you sank to your hips, and the only thing holding you up was the ice in the bottom. At last, at 7 in the morning, we walked into the small settlement soaked to the waist. I had been going 27 hours, and was ready to drop. My canoeman flopped in some shack and slept until noon, and then they were to start back, and meet me at the end of the portage sometime that night. I went to the hotel, got cleaned up a bit, and then got on a phone as soon as the telegraph office opened at 8 a.m. I phoned our office in The Pas. As luck had it, a gas car was ready to leave, and come up the railroad the 150 miles. I had him bring all the antitoxin available. I then expressed the throat swabs to Winnipeg, and prepared to await the antitoxin. I could not sleep. Around 5 o'clock, the antitoxin arrived. I had supper, and then hired a horse and guide and set off to meet my canoeman. There was a 17 mile portage, over which I was told I could ride. It was some ride. We had to swim our horses over one river, and jump two creeks. Most of the road was on high ground through the bush, but a lot of it was through swamps. However, we arrived at 4 a.m., just as my boys were getting up. We had breakfast, and then away. I slept a bit in the canoe. I needed it. Finally we arrived back at Cross Lake at 10 p.m. It was just dark. I had been on the road 66 hours with hardly a wink of sleep, and was all in. However, I went to see the cases of diphtheria. As I expected, the one child had died that afternoon. I gave the other child antitoxin and all the others prophylactic doses. There was no more diphtheria, and the one child got better. When I arrived home, there was a wire stating that the throat swabs were positive for diphtheria, and I felt my trip was justified.

It is time enough to answer questions when they are asked.—Emerson.

MEDICAL SURVEY OF NUTRITION AMONG THE NORTHERN MANITOBA INDIANS

By

P. E. Moore, M.D.

Acting Superintendent, Medical Service,
Indian Affairs Branch

H. D. Kruse, M.D.

Milbank Memorial Fund, New York City

F. F. Tisdall, M.D.

Consultant on Nutrition, Medical Branch,
R.C.A.F.

R. S. C. Corrigan, M.D.

Medical Superintendent, Norway House Agency

ECONOMIC ASPECTS OF INDIAN LIFE

AT the present time there are approximately 126,000 Indians in Canada whose health and welfare come under the jurisdiction of the Indian Affairs Branch of the Federal Department of Mines and Resources.* These people constitute no less than 1% of the total population of Canada. This 1%, however, presents a national problem in health and welfare out of all proportion to their numbers.

From the economic and occupational standpoints the Indian may be divided into four main groups. Even before the coming of the white man the Iroquois and associated tribes who lived in Ontario, Quebec and the adjacent areas of the United States were agriculturists to a degree. They lived in small villages and, in addition to hunting, grew corn. Today descendants of these Indians are largely settled in the populated districts of Ontario and Quebec, and make an important contribution to the agricultural life of these provinces. One of these tribes has become famous as structural steel workers, namely, the Caughnawagas. The second main group of Indians are the Plain Indians, descendants of the Blackfeet, Sioux, Assiniboine and Plain Cree tribes. These were the buffalo hunters. Today they have become ranchers and raise horses and cattle. They do not show great interest in other agricultural pursuits and cannot be regarded as "tillers of the soil". It is

* Since this report was written the Medical Service of the Indian Affairs Branch has been transferred from the Department of Mines and Resources and is now known as the "Indian Health Services, Department of National Health and Welfare".

even difficult to get them to raise dairy cattle, which observation is significant in view of their aboriginal habits of being meat eaters and hunters of buffalo. The third main group are the Coast Indians of British Columbia who were in the time of Captain Vancouver, and are today, fishermen. Their ability as fishermen is great. Unfortunately, before World War II their economic status was reduced by the unscrupulous encroachment of the Japanese. The fourth, and by far the largest group, occupies the hinterland of Canada. They are the descendants of many tribes, such as the Nascoies, Montaignais, Tête de Boules, Chippewas, Saulteaux, Swampy Crees, Chipewyans and Siccanies. These Indians, frequently referred to as "Bush Indians", constitute roughly one-half of the total Indian population and obtain their livelihood largely through hunting, trapping and fishing. The present investigation is limited to a study of a typical group of these Bush Indians.

There was a time when the Indian hunted for food. The skins and fur were used for clothing and covering for his wigwam. Today, however, he hunts and traps primarily for fur which is traded for food, clothing, and other articles, the products of modern civilization. Frequently he does not buy intelligently and a considerable portion of his income may be squandered on such things as radios, gramophones, guitars, trinkets and even—in isolated districts—motor cars. As an example, on a remote island in the Gulf of St. Lawrence, with a trail only three-quarters of a mile long, an Indian after paying his debt at the trading post had sufficient money left to buy and have shipped to the island a motor car. This he drove up and down the trail at all hours during the remainder of the summer. At freeze-up he left the car at the side of the trail without even draining the radiator and returned to his trap lines a hundred miles or more inland. The next year, due to the



Fig. 1.—Typical Indian hut.

vicissitudes of the trap line, the same Indian might be destitute and dependent on Government aid for himself and family.

The economic status of the Bush Indians depends almost entirely on the quantity of game, fur and fish available, and the market price of the fur and fish. During the present war many of these Indians have enlisted in the Armed Services and others have made an important

contribution to the war as labourers in the harvest fields and lumber camps. This has temporarily augmented their income. While it is impossible to estimate the average income of all the Bush Indians, the yearly income of the adult male before the war in the area where the present study was undertaken averaged \$200 to \$300. This has now been increased to approximately \$400.



Fig. 2.—Interior of Indian hut.

Formerly the Indians lived in wigwams and still do in some areas. Today the Indian is copying the white man and lives during the winter months in small one-roomed shacks (Fig. 1). Frequently the conditions are almost unbelievable—as many as 10 to 12 people living in a shack 12 feet square. The only furniture may consist of a stove in the centre and a small table or stool (Fig. 2). Sometimes there may be one broken-down single bed, but the majority sleep on the floor. The door is seldom more than 5 feet high and is covered by a blanket or old piece of canvas to keep out the wind. Two small windows let in the light, and the sole source of ventilation is the stove and the fairly large hole in the flat roof for the stove-pipe. Their sanitary habits are very primitive. Refuse and excreta litter the snow in the immediate vicinity of the house. With the advent of spring the whole family moves to tents, which they set up a few hundred feet away, and trust to the spring and summer rains to wash away the refuse. During the summer months they frequently change the location of the tents as they move about in their quest for food.

HEALTH CONDITIONS

As is to be expected from their housing conditions, epidemics occur most frequently during the winter months. Influenza, measles, whooping cough and other infectious diseases all take their toll. The infant mortality rate among the Indians studied reached the astounding figure in 1942 of slightly under 400 per 1,000 live births, with a comparable figure for the white population of Canada of 52. The crude mortality rate for 1942 was 39.04 per 1,000, in contrast with a rate of 8.3 for the white population in Manitoba. In Table I is presented the ten leading causes of death with the mortality rates.

TABLE I.
TEN LEADING CAUSES OF DEATH AMONG
CANADIAN INDIANS

	Per 100,000
Tuberculosis.....	761
Pneumonia.....	383
Diseases peculiar to the first year of life.....	177
Violent or accidental deaths.....	174
Diseases of the heart.....	172
Influenza.....	126
Diarrhoea and enteritis.....	110
Cancer.....	94
Senility.....	74
Whooping cough.....	66

Tuberculosis is the greatest single cause of death, with a death rate 14 times higher than that among the white population. In 1942, the death rate for Indians from tuberculosis for all of Canada was 732 per 100,000, with a comparable death rate among the white population of 51.4. However, in certain farming areas, where the Indians are well established, with a higher economic status and comparatively good nutrition, the death rate from tuberculosis is only slightly higher than in the surrounding white population. Among the Northern Indians death rates from 1,000 to 3,000 per 100,000 are encountered. In the area studied the death rate from tuberculosis in 1942 was 1,400 per 100,000. The comparable figure for the white population of Manitoba was 27.1.

Many factors influence this increase in mortality. Poor housing, inadequate sanitation and rigours of climate probably all play their part. Also studies conducted in many parts of the world have demonstrated that poor nutrition is accompanied by excessively high morbidity and mortality rates.

The articles of food most commonly purchased by the Bush Indians are white flour, lard, sugar, tea and a small amount of oatmeal. The Indians living in the remote areas only visit the trading posts once or twice a year to trade their furs for food and other articles. They usually stay in the neighbourhood of the post for three or four weeks before they depart again in their canoes for another year's hunting. The difficulties of preservation and transportation severely restrict both the amount and the kind of food purchased. As a result of this these Indians of necessity live on what flour, lard and sugar they can transport and the berries, game and fish that they obtain. The Indians living in the neighbourhood of the trading posts depend to a much greater extent on "store food" than on food obtained from the country. While these Indians purchase a somewhat greater variety of food, their chief purchases are still flour, lard, sugar and tea (Table II). In some sections a limited amount of potatoes is grown. It would seem to be difficult under these circumstances for the diet of the Indian to be other than deficient in many respects.

The diet of the Bush Indian has deteriorated in the past 40 years. Records kindly furnished by the Hudson's Bay Company, through Mr. D. H. Learmonth, the present factor at one of the Company's posts in Northern Manitoba, who

TABLE II.
FOODS PURCHASED BY THE NORWAY HOUSE
INDIAN IN 1941

Food	Amount per person per day, oz.	Calories per person per day
Flour.....	8.77	885
Lard.....	0.96	246
Sugar and jam.....	1.17	127
Bacon and dried salt pork.....	0.19	39
Rolled oats.....	0.32	36
Baker's bread.....	0.44	33
Butter.....	0.13	27
Beans.....	0.42	23
Milk—evaporated.....	0.42	17
Rice.....	0.11	10
Other foods.....	0.41	27
Total calories.....		1,470

was also associated with the Company in the same area nearly 40 years ago, bears this out. At that time an Indian family consisting of the man, his wife and 2 or 3 children, would set out in October for a period of 7 months with about 100 pounds of flour, a small amount of lard and beef suet, and a few pounds of tea and sugar which were considered luxuries. The main portion of the food was obtained "off the land", caribou, moose, beaver, muskrat, rabbit and fish. Today a typical example from the records is that of an Indian trapper of a better type than average who set off in October with his wife and no children taking with him no less than 600 pounds of white flour, 130 pounds of lard, 50 pounds of sugar and 25 pounds of tea. Today

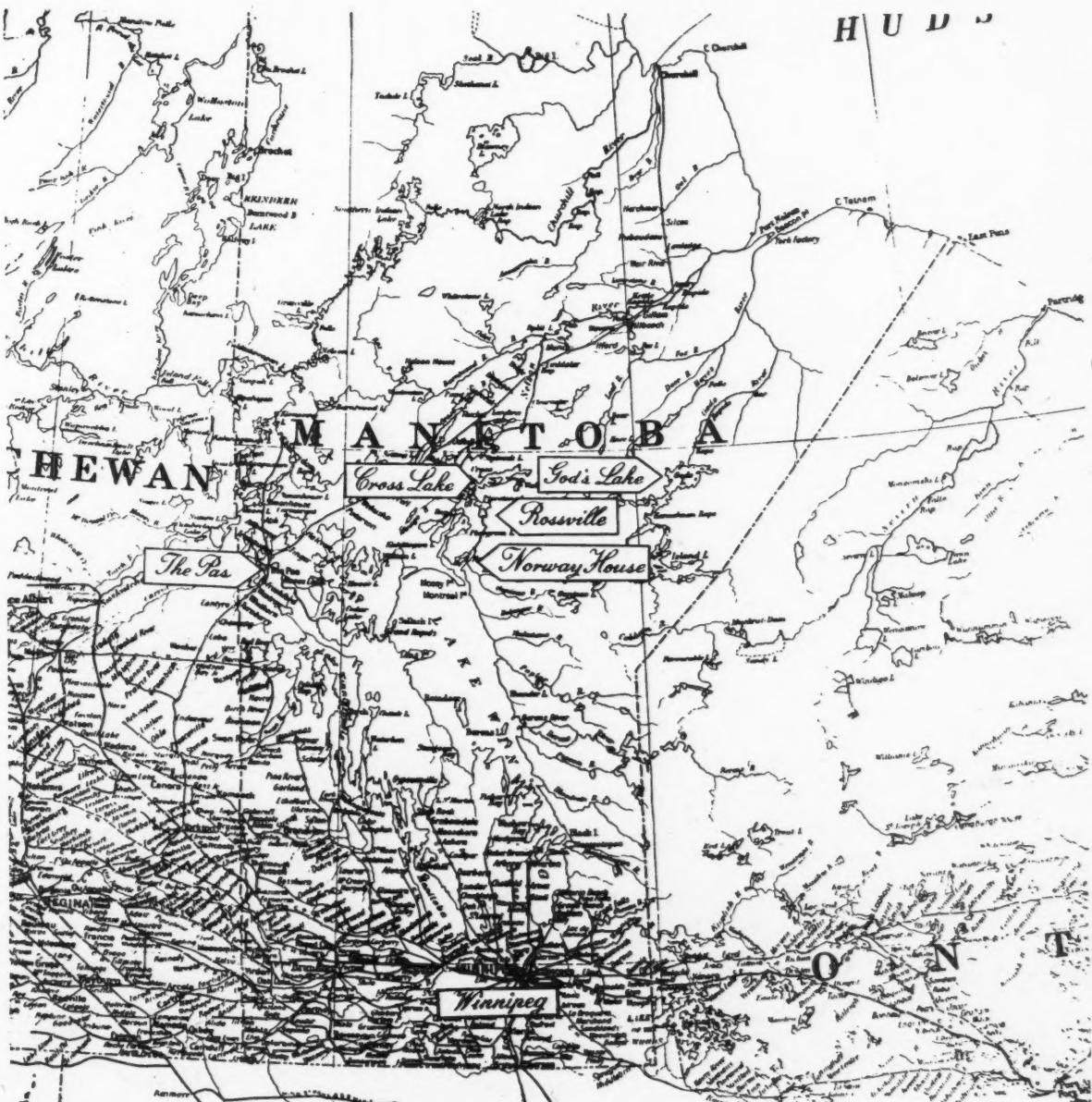


Fig. 3.—Map of area surveyed.

too the Indian "cleans" his fish and animals and discards highly nutritious organs that were formerly eaten.

It can be stated that without exception in those areas where the dietary habits of the Indian have changed from the consumption of foods from the country itself to "store food", which is largely white flour, lard and sugar, the physical condition of the Indian has markedly deteriorated in recent years.

The Medical Division of the Indian Affairs Branch has long been aware of the poor dietary habits of the Indian and their probable relation to his poor physical condition and high susceptibility to infection. Accordingly it appeared highly desirable to obtain further information on the part that malnutrition plays in the health of the Bush Indian.

SCOPE OF SURVEY

In March, 1942, a survey was organized by the Medical Division of the Indian Affairs Branch with the assistance of the Hudson's Bay Company, the Milbank Memorial Fund of New York City, and the Medical Branch of the Royal Canadian Air Force. The area chosen was in Northern Manitoba, approximately 350 miles north of Winnipeg (Fig. 3). The area is readily accessible by air. The places visited were God's Lake, Cross Lake, Norway House and The Pas. The Indians in this area are representative of the Bush Indians across Canada. The total Indian population of the area is 2,449.

For several reasons the survey was concentrated at Norway House. Here information could be obtained on the food supply. Also Indians were available in large numbers for examination at one site because a band is situated around the post and the local Indian hospital provided excellent facilities for the operation of special instruments and cameras.

Although a dietary survey was not conducted, special circumstances provided reliable evidence on the dietary habits of the Indians studied. All of their staple foods are imported and the trading post is the sole source of them. Through the Hudson's Bay Company records were obtained of the food purchased during the year 1941 by several hundred Indians in the area studied. The basic diet was supplemented by a small quantity of berries in season and what fish and game they could obtain.

More than 400 Indians of both sexes and all ages were examined; records were kept on 215.

Of the latter number, 187 were seen at Norway House and 28 at God's Lake.

In addition to a search for the advanced stages of nutritional deficiencies, such as keratomalacia, beri-beri, pellagra, scurvy and rickets, certain tissue changes which have been attributed by one of the authors (H.D.K.) to nutritional deficiencies were sought.^{1 to 6} These changes involve the conjunctivæ, the blood vessels at the corneal scleral junction, the gums and the tongue and have been ascribed by him to avitaminosis A, ariboflavinosis, avitaminosis C, and aniacinosis respectively. Examination was made for gross changes and in approximately half of the subjects the conjunctivæ and the ocular limbic blood vessels were also viewed through a biomicroscope. As a basis of appraising thiamine status an abridged neurological examination included: palpation of calf muscles; tests for triceps and patellar reflexes and vibratory sense.

Considerable difference of opinion exists concerning the specificity of these signs but most workers agree that they are found with greater frequency among malnourished than well nourished population groups.

RESULTS

Available food supply.—The food purchased by the Indians in the Norway House area is recorded in Table II. It is to be noted that of the 1,470 calories purchased per person per day, no less than 1,258, or 85% of the total, were supplied by the white flour, lard, sugar and jam. All these foods are either devoid of or extremely low in vitamins and minerals. A number of the nutritional factors in the foods purchased were calculated. The values are set out in Table III. It is impossible to estimate how much additional food was obtained by fishing and

TABLE III.
NUTRIENTS AVAILABLE PER PERSON PER DAY
FROM FOOD PURCHASED IN 1941

Nutrient	Amount per person per day in food purchased	Weighted recommended daily allowance per capita calculated for Canada
Calories	1,470	2,544
Protein	34 gm.	66.1 gm.
Fat	40 gm.	...
Calcium	103 mgm.	960 mgm.
Phosphorus	372 mgm.	...
Iron	9 mgm.	11.8 mgm.
Vitamin A	238 I.U.	4,590 I.U.
Thiamine	0.35 mgm.	1.45 mgm.
Riboflavin	0.25 mgm.	2.10 mgm.
Niacin	3.8 mgm.	14.5 mgm.
Ascorbic acid	1.0 mgm.	71.3 mgm.





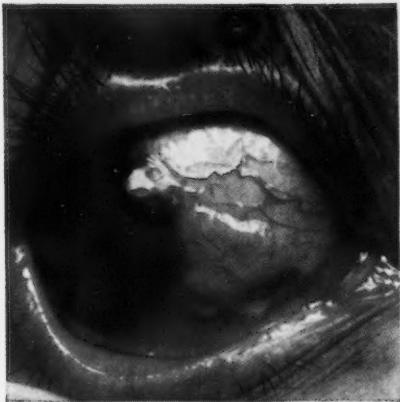


Fig. 4.—Conjunctival changes—male aged 32. Marked thickening and yellowish brown discoloration of conjunctiva.

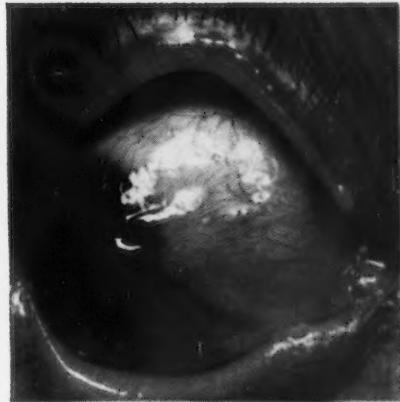


Fig. 5.—Pterygium—male aged 51. Marked thickening of conjunctiva with pterygium extending on to cornea almost to the pupil.



Fig. 6.—Snow blindness—male aged 12. Marked hyperæmia of vessels in conjunctiva. Edema, cloudiness and lack of clarity of cornea and conjunctiva.



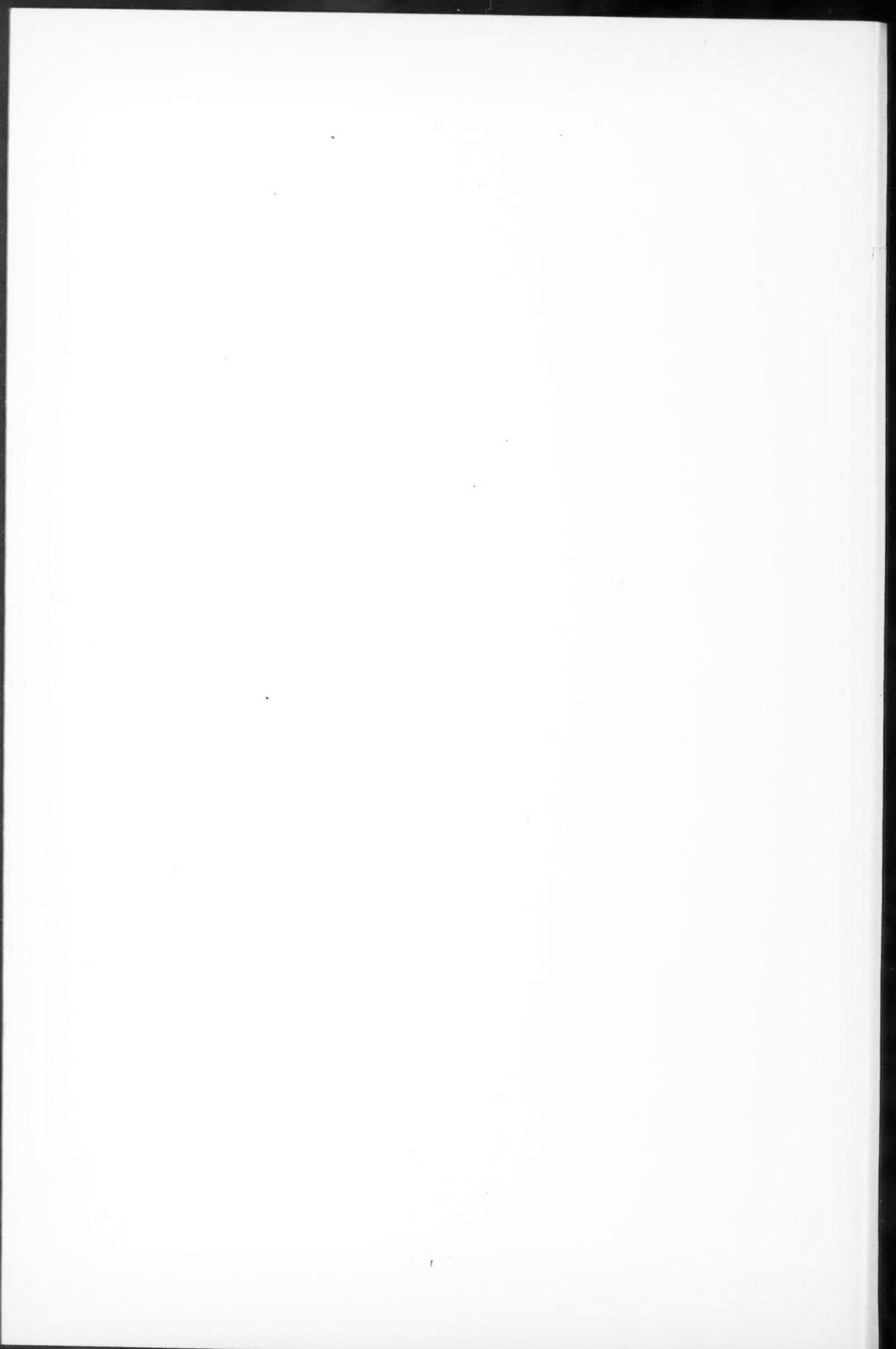
Fig. 7.—Gingival changes—male aged 27. Swelling of gingival tissues with recession and detachment from teeth.



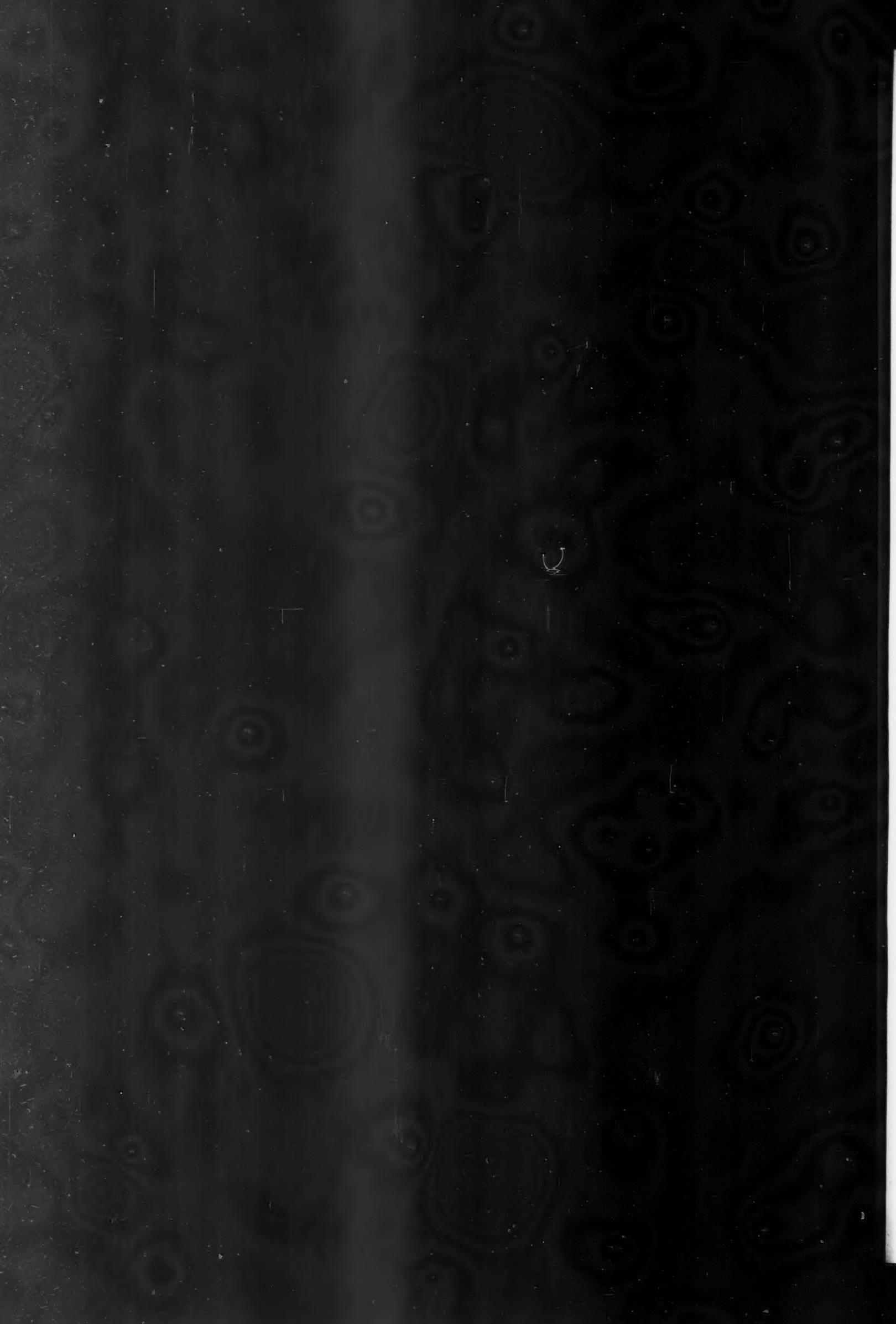
Fig. 8.—Gingival changes—male aged 57. Marked thickening of gingival tissues with loss of interdental papillæ.



Fig. 9.—Tongue changes—male aged 43. Multiple fissuring with atrophy of papillæ at tip and lateral margins.







hunting, but due to the depletion of the fish and animals in the area, the amount must have been relatively small.

Physical measurements of the Indians were not taken. The Indian today however is smaller than 40 years ago. The shirts sold then were sizes 16 to 17, now the common sizes are 15½ to 16; the pants were sizes 38 to 44, now 34 to 38. Furthermore, in the past the Indians are said to have been energetic and accounts of their remarkable vigour have been perpetuated by both legend and record. In contrast, at present they generally show listlessness, indolence and inactivity. There is no doubt in the opinion of the older white inhabitants that there has been in the past 40 years a marked deterioration in the physical condition of the Norway House Indian.

No single classical deficiency disease was seen. However, every Indian observed had some abnormality of the conjunctivæ, ocular limbic blood vessels, tongue or gums. The most marked changes were in the conjunctivæ, ocular limbic blood vessels and gums.

Conjunctival changes.—As the changes which have been ascribed by one of the authors (H.D.K.) to a lack of vitamin A develop in the conjunctiva it becomes over-vascularized, thickened, at first translucent, then opaque, discoloured or even pigmented. Of 194 adult Indians whose conjunctival examination was recorded, all had advanced changes in their conjunctivæ characterized by thickness, opacity and discoloration (Fig. 4). The thickening was first obvious in children between 10 and 15 years of age, and became progressively more marked with increasing age. In 11% pterygia were also present (Fig. 5).

Neurological signs.—It is generally recognized that the early signs of beri-beri include calf tenderness, diminution or loss of vibratory sense, and modification of reflexes, such as hyperactivity, hypoactivity or complete loss. It is obvious that each of these individual signs can occur in conditions other than beri-beri. Nineteen per cent of the persons examined showed neurological signs, chiefly modified or lost reflexes. Because of language difficulties the test for vibratory sense could not be reliably conducted.

Changes in the blood vessels at the corneal scleral junction.—Normally the blood vessels of the ocular limbic plexus do not extend into the cornea. It has been reported^{2, 3} that a lack of riboflavin in the diet results in the engorgement

of the limbic plexus and vascular proliferation with invasion of the cornea. Coincident with this there may be tiredness of the eyes, sandy sensation under the lids, lachrymation and photophobia.

The only voluntary symptomatic complaints obtained from the Indians were referable to the eyes. The ocular symptoms were distinctly troublesome. Many complained of lachrymation and photophobia and lack of sharpness of vision. Prominent amongst the complaints were a burning sensation and a gritty feeling in the eyes. Considering that the ground everywhere for several months had been and was covered with several feet of snow, the presence of sand or any other foreign body in the eyes was most unlikely.

The symptoms of snow blindness are essentially the same as those just described but of greater intensity. The condition usually develops in February, March and April, when the days are beginning to lengthen and the amount of light reflected from the snow is becoming very great. The patient has usually been exposed to this bright light for some days. Suddenly, without warning, usually on a day when the sky is a little hazy, he develops in a matter of one to two hours intense pain in the eyes, described by some as a burning sensation, by others as a stabbing sensation, a gritty feeling under the eyelids with swelling, headache, extreme lachrymation and photophobia. In severe cases the conjunctivæ become intensely red due to congestion of the blood vessels. The condition may develop so suddenly that the individual has difficulty in getting back to his shelter or habitation. The treatment employed is simply to lie in a dark room with cold compresses over the eyes. In the course of one to two days the symptoms subside. It is recognized that the development of the condition is associated with exposure to intense light. A preliminary report⁷ has already been given, drawing attention to the similarity of the symptoms to those produced by a lack of riboflavin.

Four per cent of the Indians examined had congestion of the ocular limbic plexus which was seen grossly as a circumcorneal injection sometimes extending over most of the conjunctivæ (Fig. 6). Lachrymation and photophobia were very marked. Almost all of these subjects volunteered the opinion that they were suffering from snow blindness. Examination by one of the authors (H.D.K.) with the biomicroscope showed extension of injected blood vessels into

the cornea. Of the remaining subjects examined with the biomicroscope all showed proliferation of the blood vessels into the cornea but with no marked congestion. Lachrymation and photophobia were present in a large percentage of these.

Gum changes.—Recently in animal studies, on monkeys,⁸ redness, swelling, bleeding and tenderness of the gingivæ have been produced by a chronic lack of ascorbic acid. Studies⁹ conducted on Royal Canadian Air Force personnel have shown that gingivitis which had been treated locally recurred more frequently when the diet was low in ascorbic acid than when it contained the recommended allowance of 75 mgm. per day. Kruse⁴ in 1942 reported that changes of the gingivæ characterized by redness, swelling, bleeding and tenderness responded to large amounts of ascorbic acid when administered over a period of one year or longer.

In the present survey the gingival tissues were examined for redness and swelling. In addition other changes of a more chronic nature, particularly thickening, loss of interdental papillæ and recession of gum tissue so that a greater length of the tooth surface was exposed, were noted. Ten per cent of the Indians examined had evidences of acute inflammation of the gingivæ; 81% had subacute signs (Fig. 7) and all of those examined had chronic changes in the gingival tissues, most of which were marked (Fig. 8).

No cases of scurvy were seen.*

Tongue changes.—None of the Indians examined showed the severe red, swollen tongue characteristic of pellagra, but most of them exhibited some redness and swelling of the lingual papillæ. Almost all showed atrophic papillæ and fissures (Fig. 9). These changes were not of a severe nature.

DISCUSSION

It is obvious that the basic food of the Norway House Indian was deficient in practically every nutritional factor studied. The supplemental game provided some additional protein and due to the habit of the Indian of eating the small bones, some calcium. It also probably provided an appreciable amount of niacin, due to the relatively high concentration of this vitamin in meat and fish. But the entire diet provided little vitamin A, B₂ (riboflavin) and vitamin C

(ascorbic acid). The supply of thiamine while greater than that of vitamins A, B₂ and C was still quite inadequate. It should be borne in mind that the above comments refer to average conditions and the amounts actually consumed by many families were even less satisfactory.

It has recently been pointed out that dietary requirements are relative to many environmental as well as endogenous conditions.¹⁰ It has become increasingly evident that light belongs in the list of conditioning factors and that prolonged exposure to it greatly increases the requirements for certain dietary essentials. The extremely intense glare in the region surveyed due to reflection from the snow and the necessary prolonged exposure of the Indians to it because of their occupation, places them in need of much higher riboflavin intake than is usually regarded as adequate for unexposed persons in regions of less illumination. Thus in the face of increased need, the Indians are receiving only a small amount of riboflavin. Nor is this the only unusually heavy stress to which the Indian is exposed. The rigorous climatic conditions, the physical labour associated with gaining a livelihood and the almost constant high prevalence of active infectious disease impose extreme stress upon the Indian and conduce to the deterioration of his nutritional status.

It is recognized that there is a diversity of opinion as to the relationship of the tissue changes here observed to nutritional deficiencies. However, if the signs are taken as indicative of nutritional deficiency states, namely, the conjunctival changes as indicative of a lack of vitamin A, the ocular blood vessel changes of a lack of riboflavin, the gum and tongue changes of a lack of ascorbic acid and niacin respectively, the parallel between the prevalence and the severity of these signs and the nature of the deficiencies in the diet is striking.

Although the survey was limited to Northern Manitoba, one of the authors (P.E.M.) has observed similar tissue changes occurring with high frequency and severity in other bands and reservations. The occurrence of tissue changes in such frequency and severity is not peculiar to Indians. Similar conditions in another group have been reported. After a survey of Eskimos in the Canadian Eastern Arctic, Rabinowitch¹¹ reported that in the vast majority of eyes examined there was intense congestion of the conjunctivæ; pterygium was very common; and snow blindness occurred very frequently during the winter months. He stated that the blepharitis

* In 1944 one of the authors (R.S.C.C.) observed an Indian woman with classical signs and symptoms of scurvy which responded to the administration of ascorbic acid.

tis, the dryness of the conjunctivæ, and the sticky shreds of Meibomian secretions on the lid margins were suggestive of vitamin A deficiency. His mention of the occurrence of pyorrhœa indicates that he saw gum conditions comparable to those seen in the Indian in the present survey.

Once again poor nutrition has been found to accompany excessively high morbidity and mortality rates. Voluminous evidence from experiments with animals attests that nutritional status influences these rates. The relatively few human studies on the subject point in that direction. It is not unlikely that poor nutrition is responsible in part at least for many characteristics of the Indian, such as shiftlessness, indolence and inertia which have long been regarded as inherent or hereditary traits. Furthermore, it is probable that their great susceptibility to many diseases, paramount amongst which is tuberculosis, may be attributable among other causes to their high degree of malnutrition arising from the lack of proper foods.

SUMMARY

1. A survey was made of the dietary habits and the nutritional status of more than 400 Canadian Bush Indians.

2. The dietary intake failed to meet the recommended daily allowances for most nutrients. For a number of the nutrients the margin was so far under the recommended levels that it is obvious the diet was markedly deficient. The most pronounced vitamin deficiencies were vitamin A, vitamin B₂ (riboflavin) and vitamin C (ascorbic acid).

3. Multiple and marked tissue changes were encountered in practically every Indian examined, the most marked changes being in the conjunctivæ, the blood vessels at the corneal scleral junction and the gums. These changes have been attributed by one of the authors (H.D.K.) to a lack of vitamin A, vitamin B₂ and vitamin C respectively.

4. The parallel between the prevalence and the severity of these signs and the degree of the deficiencies in the food supply is striking.

5. The Indian infant mortality rate, the crude mortality rate and the death rate from tuberculosis are many times higher than in the white population. All these conditions present a national problem in health and welfare far in excess of the numerical proportion of the Indian to the white population.

6. In common with the results of studies done in many parts of the world, poor nutrition has

been found in a population group with excessively high morbidity and mortality rates.

7. It is not unlikely that many characteristics, such as shiftlessness, indolence, improvidence and inertia, so long regarded as inherent or hereditary traits in the Indian race, may, at the root, be really the manifestations of malnutrition. Furthermore, it is probable that the Indians' great susceptibility to many diseases, paramount amongst which is tuberculosis, may be attributable among other causes to their high degree of malnutrition arising from lack of proper foods.

ADDENDUM

While this paper was in press the attention of the authors was directed to a monograph "C-Hypovitaminose" by Johns. Hagtvet, Norway, in which the author found that the average vitamin C food supply in Northern Norway was 5, 10 to 15 mgm. of ascorbic acid daily. He reports the marked prevalence of chronic gingivitis, and states, "This under-feeding with respect to vitamin C seems to have as a regular consequence chronic gingivitis, marginal osteitis and a tendency towards spontaneous bleedings."

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RÉSUMÉ

400 Indiens du nord du Manitoba ont été observés au double point de vue de leurs habitudes alimentaires et de leur état général. Les déficiences vitaminiques sont la règle, notamment, les déficiences en vitamines A, B₂ et C. Les altérations de leurs conjonctives, de leur cornée et de leurs gencives traduisent assez nettement les carences précitées. La mortalité infantile est très élevée, notamment, la mortalité due à la tuberculose. L'indolence, l'inertie et l'apathie de ces sujets n'est pas un trait racial,—comme on l'a cru trop longtemps,—mais provient plutôt de troubles profonds dûs à une mauvaise alimentation; cette même étiologie est également à la base de leur manque de résistance à l'égard des infections, et plus particulièrement de la tuberculose.

JEAN SAUCIER

CLINICAL ASPECTS OF THE BOWEL OBSTRUCTION PROBLEM*

By O. H. Wangensteen, M.D.

Department of Surgery, University of Minnesota Medical School, Minneapolis, Minn.

IN 1883, when Treves wrote his essay on *Intestinal Obstruction*, the operative era in abdominal surgery was just beginning. In 1888, when the first joint meeting of the American Association of Physicians and Surgeons was held, it was debated whether patients with acute intestinal obstruction should be operated upon or treated by conservative (non-operative) means, consisting essentially of morphine, aperients, abdominal stapes and colonic lavage. The consensus of the discussion was that after conservative measures had been employed without success for two days, recourse should be had to surgery. In the 1899 edition of his book, Treves, in emphasizing the importance of operation stated: "Those who are enamoured of statistics could, I have little doubt, show that it is less dangerous to leap from the Clifton suspension bridge than to suffer from acute intestinal obstruction and decline operation". Despite this general admission that acute intestinal obstruction was distinctly a surgical disorder, little or no improvement in the management was recorded. In 1929, thirty years after Treves' pronouncement, the mortality of acute intestinal obstruction at the Charity Hospital and Touro Infirmary, as reported by the late C. Jeff Miller, was 60.9%. A mortality of 40 to 60% was general, and its cause was attributed largely to the alleged absorption of intestinal toxins from the obstructed bowel.

Already, however, in 1912, Hartwell and Hoguet had shown that the toxæmia of high obstruction was a misnomer. By administering saline solution subcutaneously to dogs with complete obstruction of the duodenum, they were able to maintain these dogs alive for three weeks. The first proffered explanation of this occurrence was that of Haden and Orr (1923), who postulated that the saline solution detoxified a toxin "X", which caused death when unopposed. It remained for Gamble and Ross (1925) to indicate that saline solution was a good antidote for a high simple obstruction (duodenal) be-

cause it replaced satisfactorily the electrolytes lost by vomiting.

In 1931, it was pointed out that some types of acute intestinal obstruction were amenable to management by suction¹³ applied to an indwelling duodenal tube. Successive studies served to emphasize the great importance of distension in the genesis of the ill effects of acute intestinal obstruction. I shall allude briefly to one of these studies. In 1939, Rea and the writer¹⁶ observed that if the cervical oesophagus were divided in the dog, and the distal end inverted to obviate the swallowing or aspiration of air, obstruction of the terminal ileum was well tolerated. A number of dogs, to which glucose and saline solution were administered, survived the procedure for more than 40 days; one dog survived for 57 days, and at autopsy, there was little or no distension of the obstructed intestine. In other words, in the absence of swallowed air, despite complete obstruction, the intestine was able to absorb the digestive juices dumped into it.

In 1938, Abbott and Johnston observed that by attaching a small inflatable rubber balloon to the tip of a long tube, early migration of the tube into the lower reaches of the obstructed intestine could be achieved, with resultant increase of the incidence of successful decompression by conservative means. The present trend is to correct dehydration by the administration of saline solution; to attempt conservative decompression by intestinal intubation, and if not achieved readily to resort to surgery. In other words, protracted trial with conservative decompression before recourse to operation is not enjoying as wide trial as it had toward the end of the last decade or the beginning of the present one. The suggestion of Fine and his associates (1936) to treat intestinal distension by the inhalation of high concentrations of oxygen, in our hands at least, has not proved practical in the management of acute intestinal obstruction.

THE IMPORTANT ITEMS IN BOWEL OBSTRUCTION

An appreciation and understanding of the following factors is essential for effective management in dealing with the problem of bowel obstruction: (1) Recognition of the effects of obstruction. (2) Technique of diagnosis. (3) Choice of therapeutic procedures. These items will be discussed briefly.

I. THE EFFECTS OF OBSTRUCTION

Whereas the number of clinical varieties of obstruction is large, from a pathological stand-

* Read at the Seventy-sixth Annual Meeting of the Canadian Medical Association, Section of Surgery, Montreal, June 13, 1945.

point, there are essentially only two kinds: (1) simple, and (2) strangulating obstructions. In the former, there exists only obstruction to intestinal continuity; in strangulating obstruction, compromise of the blood supply to the bowel wall is also threatened. In long-standing simple obstructions, in which long reaches of the gut are involved and cannot be emptied through the agency of vomiting, because of mounting intraluminal tension, maintained ultimately at levels above the mesenteric vein pressure, nutritional effects upon the bowel wall come into evidence. In other words, the blood supply of the bowel wall becomes compromised because of the persistently increased intraluminal pressure. In complete obstructions of the colon, when the lips of the ileocecal sphincter act as a check-valve, permitting gas and fluid to be dumped into the colon from the small bowel, but prevent regurgitation back into the ileum, a closed-loop obstruction frequently results; under these circumstances the tension in the obstructed colon mounts rapidly and because of the thinness of the cæcal wall, perforation may occur. Here then, is another simple obstruction, which also may, with the elapse of time, behave as a strangulating obstruction.

In frankly strangulating obstructions such as volvulus or torsion due to an adhesive band, if the strangulated segment is long, the blood loss may be great owing to haemorrhage into the infarcted segment. These occurrences all serve to indicate that the effects of bowel obstruction are essentially mechanical. Fluid may be lost by vomiting and obviously should be replaced in amount and in kind imitating the character of the losses. The most devastating effects of continued obstruction are wrought upon the bowel wall itself; that is, intraluminal tension threatens the viability of the intestine, ultimately permitting transperitoneal migration of toxic substances. The threatening and deadly primary effects of strangulating obstructions become manifest more quickly than in simple obstruction because the viability of the bowel is compromised from the beginning.

II. THE DIAGNOSIS OF OBSTRUCTION

1. *Is obstruction present?*—The history is of importance. A story of intermittent crampy colicky pain is usual. The patient may have detected, as the obstruction progresses, the concurrent occurrence of intestinal gurgling and

pain, synonymous with the presence of *intestinal colic*. The patient usually describes these as "gas pains". The first step in the diagnosis, therefore, is determining whether intestinal colic is present. Every patient with bowel obstruction has intestinal colic. Obviously, enterocolitis, food indiscretions and functional spastic conditions must be ruled out. Ordinarily this is not too difficult on the basis of such general findings as fever, diarrhoea, distension and vomiting. It is to be admitted freely, however, that there are "spastic contractions" of the bowel which mimic organic obstruction so closely as to defy differentiation.

2. *Is the obstruction simple or strangulating in type?*—Simple obstruction is unattended by abdominal tenderness and is characterized only by *intestinal colic*. Strangulating obstructions have to be differentiated from all conditions which cause tenderness of the abdominal wall (which means most acute abdominal disorders). The pathognomonic finding of *intestinal colic* serves to differentiate. Only in those acute inflammatory lesions in which exudate causes arrest of intestinal continuity does difficulty arise in determining whether the obstruction is simple or strangulating in type. It is to be conceded freely that this distinction at times cannot be made absolutely without recourse to operative intervention. In late simple obstruction, in which sustained increases of intraluminal pressure have been present for two days or more, the gut may "weep". As a result of this sudden transudation of fluid into the peritoneal cavity, the peritoneum, the most sensitive of all serous membranes, exhibits "rebound tenderness" occasionally—an indication that something has escaped into it. McKittrick (1941) is inclined to lend greater credence to a rising leucocyte count as suggestive of the presence of a strangulating obstruction.

One of the difficulties which hedges about the recognition of strangulating obstructions which are first observed, only after the lapse of some time, is the lack of active peristaltic activity. *Intestinal colic* is, therefore, frequently not a prominent feature in late strangulating obstruction, peristaltic activity being inhibited in part by the escape of sanguineous fluid into the peritoneal cavity. Yet auscultation of the patient's abdomen over long intervals of time will usually serve to identify the presence of intestinal colic. Careful attention to the details of the history helps considerably in orienting the observer.

There are occasional circumstances, very unusual to be sure, in which a patient may harbour a strangulated intestinal loop without there being much evidence, clinical or by x-ray, of intestinal distension. And ordinarily, the agency which brings about ensnarement of a loop of bowel or its torsion provokes a mechanical simple obstruction in the intestine immediately proximal to the strangulation. In the usual strangulating obstruction, therefore, there are usually two coexisting varieties of obstruction, *viz.*, (1) strangulation of the torsioned loop and (2) simple obstruction in the intestine proximal to the site of strangulation. It would seem sane to rationalize, then, that in order to initiate the strangulating effects of a compromised blood supply in the imprisoned loop, the strangulating mechanism should obstruct the proximal bowel. In the main, as has been admitted, such is the usual circumstance. Nevertheless, as anyone who has had a wide experience with the bowel obstruction problem will bear witness, occasionally a patient will present himself with a strangulating obstruction and a devitalized bowel demanding excision, with little or no manifest evidence of distension. There may be little or no evidence of gaseous distension on the x-ray film. As in most mechanical obstructions, vomiting is a predominant symptom. The abdomen is usually tender and a mass can be made out occasionally.

The lesson to be learned from all this is that the return of venous blood from an imprisoned loop of bowel may be impeded without the presence of a mechanical block to the continuity of the intestine. This occurrence is explicable only on the basis that: (1) the agency responsible for the compromise of blood flow to and from the bowel does not occlude the lumen of the bowel; and (2) transport is possible through a strangulated loop of bowel, which, at operation, may give every evidence of having lost its viability. My colleagues, Clarence Dennis, and Leo Rigler⁴ at the University Hospital have indicated that fixation in position of a single intestinal coil exhibiting both gas and fluid is suggestive of a strangulating obstruction.

3. *Is the obstruction in the small or large intestine?*—The distinction between obstruction of the small and large intestine can often be made on clinical evidence. In the former, repeated vomiting, often copious in amount, is the rule, contingent in part, of course, on the grade of obstruction present. Stercoraceous or

feculent vomit is characteristic of obstruction of the lower ileum. In obstruction of the colon, on the contrary, vomiting is often absent altogether. Reflex vomiting may occur initially as it may with any abdominal colic. The absence or presence of vomiting in obstruction of the colon hinges upon the occurrence of regurgitation from the colon into the ileum, which in turn depends upon the length of the lips of the ileocecal valve. When one of these is deficient in length (the inferior, usually) such regurgitation may occur. In my experience however, the competency of the ileocecal valve and sphincter is the rule, though it is to be admitted freely that exceptions do occur. A circumstance which attests the frequency of competence of the lips of ileocecal valve is the occurrence of perforation of the cæcum in neglected cases with colonic obstruction.

Patients with colonic obstruction not only may fail to vomit, but gastric aspiration in such cases demonstrates almost invariably the absence of gastric retention. Only gastric juice or air is aspirated usually from the stomach, whereas in obstruction of the small bowel, the aspirations are often large in amount and frequently brown in colour, significant of the presence of stasis in the small bowel. The bottles used for collecting the fluid aspirated from the stomach should, therefore, be transparent so that this important item may be noted with accuracy.

4. *The value of the roentgen film.*—The roentgen film reveals significant information concerning two important particulars: (1) where the distended intestinal coils are, and (2) the extent of that distension.

Whether the colon or the small intestine is distended can be determined usually without difficulty. There are times, however, when it is by no means easy to decide which is distended. The basis of this differentiation has been described elsewhere¹⁴ and will not be reported here. The size of the distended coils, bearing in mind the diffraction of the roentgen-rays and the enlargement of the image (usually about 25% of an object within the peritoneal cavity, with the patient supine), gives helpful information in determining whether the obstruction is complete or incomplete and whether the distension is of such a grade as to threaten the viability of the bowel wall.

The value of the roentgen findings cannot be overestimated when correlated intimately with the clinical findings. To recommend therapy or

employ it without recourse to roentgen examination is to neglect an important source of information. Yet, interpretations reported by the roentgenologist without knowledge of the clinical status may be very misleading. Roentgenologists, on the basis of their source of evidence alone, diagnose obstruction not uncommonly when it does not exist.

5. *Enemas*.—Enemas are of no value in determining whether obstruction is present. Their chief worth lies in ascertaining whether obstruction in the small bowel is complete or not. If a patient has had evacuant enemas and an x-ray film indicates that gas is still present in the colon, it indicates that gas has succeeded in getting past the obstructive lesion. Enemas must not be given in the presence of an inflammatory intraperitoneal lesion for fear of disseminating the infection.

6. *Identification of the obstruction*.—In résumé one may say that the presence of *intestinal colic* in correlation with other attendant symptoms or physical signs enables one to say that bowel obstruction is present. The absence or presence of rebound tenderness determines whether the obstruction is simple or strangulating in nature. Whether the obstruction is in the small intestine or colon can be stated with surprising accuracy on the basis of the absence or presence of vomiting and by the absence or presence of intestinal fluid in the gastric aspirations. The return of a brownish feculent-like material indicates that the obstruction is in the small bowel. In colonic obstruction, gastric fluid, occasionally tinged with bile and air constitutes the return; occasionally, there may be no return. Roentgen-ray observations lend helpful confirmatory evidence. Whether the obstruction is complete or partial may be determined by the size of the distended intestinal coils measured with a metric rule on the roentgenogram. It is obvious that a complete obstruction will cause maximal distension of the obstructed bowel. In obstruction of the small intestine the persistence or absence of gas in the colon after evacuant enemas helps to decide.

III. THERAPY

(a) CONSERVATIVE MEASURES

1. *Saline solution*.—It has been indicated that the virtue of saline solution lies in its ability to restore a disturbed electrolyte balance and to combat dehydration. In all high obstructions

in which vomiting is a prominent feature and in which dehydration and loss of electrolytes obtain, saline solution may improve the patient's status in the same measure as pouring water on a withering flower. Such a measure accomplishes nothing, however, for the relief of the obstruction; it merely improves the condition of the patient to tolerate what needs to be done to re-establish intestinal continuity. In patients with low obstruction (colonic) in which vomiting may be absent altogether, saline solution is in no sense the specific revitalizer that it is for high obstructions.

2. *Transfusion of blood and plasma*.—In all strangulating obstructions in which the imprisoned segment of bowel is long, the loss of blood may be great. This situation is heralded usually by a hurried pulse, even though a normal blood pressure may be sustained. A quickened pulse unrelieved by the administration of saline solution in a patient who exhibits the signs of a strangulating obstruction (*intestinal colic* plus rebound abdominal tenderness) is an absolute indication for the transfusion of blood or plasma. A patient with intussusception may bleed to death into the infarcted gut. It is startling to observe what transfusion may do for such a patient.

The distension *per se* causes a loss of fluid from the intestinal vessels into the peritoneal cavity. Moreover, large intestinal distensions segregate blood in the vessels of the lower extremity and impede its return. Employment of the Trendelenburg position to facilitate drainage of venous blood from the lower extremities is, therefore, in order. In simple obstructions accompanied by considerable intestinal distension, the transfusion of plasma to replace the fluid which has been lost from the circulation by transudation into the peritoneal cavity is probably as efficacious as the transfusion of blood.

3. *Oxygen*.—The inhalation of high concentrations of oxygen, as suggested by Fine and his associates, does encourage the migration of nitrogen from the bowel. Swallowed air, the chief source of gas in the distended bowel, does not leave the bowel ordinarily in appreciable quantities because of the high partial pressure of nitrogen in the plasma. When the tension of nitrogen in the plasma is reduced to a low level by exclusion of nitrogen in the inspired gas the diffusion of nitrogen from the distended gut is encouraged. This measure should be

looked upon as an adjunct means of aiding deflation rather than as a direct attack upon the obstructing mechanism. After trial, we have discarded this therapeutic expedient in the management of mechanical intestinal obstruction.

4. *Conservative depression.*—The past decade has witnessed a general decline in the mortality of intestinal obstruction. This improvement has come about essentially by virtue of two factors: (1) a better understanding of the effects of obstruction, including fairly general acceptance of the mechanistic conception of the ill effects of obstruction. (2) An enlarged experience with the conservative plan of achieving relief of distension by suction applied to indwelling duodenal or intestinal tubes, an experience which has taught the advantages as well as the shortcomings of this plan of management.

An analysis of the factors contributing to the present mortality of obstruction indicates that two items are responsible largely, *viz.*: (1) strangulating obstructions and (2) persistent distension. In a sense, it may be said, this mortality is owing in part to the shortcomings of the conservative suction treatment, an agency which has had an important part in the reduction of the mortality of obstruction. In the instance of strangulating obstructions, no indication exists for attempting to treat such patients by suction. Yet, most clinics in which suction has been employed in the management of intestinal obstruction have suffered the embarrassment, humiliation, and tragedy of discovering too late, on occasions, that their efforts of attempting to effect conservative decompression were being misapplied to patients with strangulating obstruction, exhibiting every indication for early surgical intervention. In other words, while affecting to be able to differentiate strangulating and simple obstruction and admitting the necessity of operating upon all strangulating obstructions early, nevertheless now and then, unless the clinician is alert to this possibility, he may fall into this trap. He who essays to employ the conservative decompressive methods must be observant and eternally vigilant, lest he become ensnared by this difficulty. Obviously the only remedy is to advise early surgical intervention in all cases in which the possibility of strangulation may be present. Moreover, apart from the possibility of a patient coming to necropsy with a gangrenous bowel, while being treated conserva-

tively for a conjectured simple obstruction there are other circumstances, not so readily assessable, in which less prolonged delays with conservative management in strangulating obstructions are, at least partially responsible for additional fatalities. This delay in supplanting conservative with radical therapy is due largely, obviously, to the difficulty in identifying correctly instances of strangulating obstruction.

The conservative plan of management accepts another risk in simple obstruction in that decompression may not be achieved by suction and recourse may have to be had to operation as a last resort. This risk is less hazardous to the individual than is delay in strangulating obstruction, for, even in late cases of simple obstruction with considerable distension, a well planned and carefully executed operation may still salvage the situation. Yet, it is not to be denied that such delays occur more frequently than they should. And in the total mortality of obstruction this factor, of failure of conservative methods to deal adequately with distension, looms large as an important item.

It should also be said that no therapeutic measure can match the low mortality of the suction cases in that group in which conservative decompression is the only direct therapeutic agent invoked. The pity of it is that suction management is not uniformly successful. In the first series of cases of acute obstruction treated by conservative decompression reported from this clinic in 1933, by Paine, and the writer, the mortality was only 5%. In the next report, made in 1939, the mortality in the suction group was 6%. In the next series, reviewed by Dennis and Brown,² 1942, from this clinic, the mortality in the suction group (32 cases) was zero. Yet, as indicated, in all these reports, and as has been pointed out, an analysis of that group alone fails to tell the whole story. For, it is possible that a patient starts out as a bona fide suction case and shows up ultimately in the mortality columns of operative procedures.

There are other factors which contribute to the existing residual mortality of bowel obstruction. Some obstructions, particularly atresia of the newborn and strangulated incisional hernias in obese patients with poor cardiac reserve are inherently difficult to deal with; others, such as mesenteric thrombosis and the ileus of peritonitis, will always carry formidable risks. Some of the factors involved in the obstruction problem appear to be uncontrollable. It is to

be remembered, however, that late recognition of obstruction and delays in hospital may make a very difficult problem out of an obstructive agency which might have been dealt with very simply in the beginning.

Yet, if the two items discussed at some length, (1) strangulations and (2) persistent great distension of the small intestine, could be dealt with in a more consistently successful manner than at present, the existing residual mortality of bowel obstruction would fall sharply. Whereas, the current mortalities of 12 to 20%, acknowledged by most clinics professing an especial interest in the bowel obstruction problem, are due in part to difficulties hedging about the management of trying cases, yet, as has been pointed out, there is a mortality of treatment, a factor which must be recognized as such, if further reduction in the mortality of bowel obstruction is to come about.

GENERAL PLAN OF MANAGEMENT IN THIS CLINIC

Since the introduction of suction¹³ (1931) in the management of acute mechanical intestinal obstruction, the general plan of management in this clinic has remained largely the same. It was recognized in the beginning that there are two *absolute* contraindications to employment of suction, *viz.* (1) strangulating obstructions; and (2) obstruction of the colon with great distension (large diameter of the distended colon, as visualized on the scout x-ray film of the abdomen). Both these conditions constitute *absolute* indications for early operative intervention. It is important that suction not be applied as the sole direct therapeutic attack upon the obstruction in instances in which the obstructing mechanism persists. It is in mechanical obstructions of the small intestine, obviously, that suction plays an important rôle as a single direct therapeutic expedient. Definition of the indications for suction in a number of cases can not, therefore, be stated positively; that is, in the larger number of instances of simple obstruction of the small intestine, the indications for the continued use of suction are relative. Without trial, one cannot know in a given instance whether suction will succeed or not; in partial obstruction suction is almost uniformly successful. The trial period must be reasonable and tempered by the knowledge that a persisting type of obstruction may be present, such as a gall stone, enteric intussusception, carcinomatous stricture or, more frequently, a

tightly constrictive adhesive band which may cut right into the lumen of the bowel. It is to be admitted freely that all patients with distension are improved by a temporary period of suction. Yet, it is important not to confound seeming improvement with complete relief of the obstruction. Obviously it is of paramount importance to have films made once or twice a day to determine with certainty whether decompression is being achieved. When a trial with suction fails to re-establish intestinal continuity early, it is essential not to procrastinate until it is too late. A timely decision is of more than ordinary importance.

The long balloon-tipped tube of Miller and Abbott¹ has superseded the ordinary indwelling duodenal tube, with multiple perforations, in this clinic in the management of all cases of obstruction. The suggestion of my colleague in Minneapolis, Dr. Ivar Sivertson¹⁴ (1941) of placing mercury in the balloon to facilitate its entry through the pylorus has proved helpful in recurring migration of the tube into lower reaches of the obstructed bowel.

In the main, however, in this clinic we are inclining to earlier operative intervention in those cases in which a reasonable trial with suction proves ineffectual; that is, persistent distension is an indication for operative intervention. Patients in whom the diagnosis of simple obstruction of the small bowel is made, are given a trial on suction. If distension persists, and if mineral oil (60 c.c.) injected through the Miller-Abbott tube is reaspirated, after an interval of an hour during which time suction is discontinued, obviously the obstruction has not relented and recourse should be had to operation.

(b) OPERATIVE MANAGEMENT

1. *Early single obstruction.*—Prior to the introduction of suction in the management of intestinal obstructions of mechanical origin, everyone conceded freely the necessity of early operative intervention. With the advent of conservative decompression, a trial with suction in suitable cases became the rule. Latterly, McKittrick (1941) has advocated and practised early operative intervention in all cases in which the obstruction is less than 24 hours in duration, after instituting suction and relieving dehydration and dechlorination. McKittrick's results justify fully his manner of dealing with the problem. The only objection which could be raised justifiably would be the question whether

some of these operations would have been unnecessary with a longer trial period of suction. Nevertheless, if fewer deaths result with return to consistent early operative intervention, it will become the preferred mode of dealing with the obstruction problem.

At all events, operation in early simple obstruction is usually not difficult. It is the presence of a sea of unruly distended bowel that makes an operation for obstruction difficult. In the early case, the obstructive mechanism may be sought out and dealt with, in accordance with the demands of the situation.

2. *Late simple obstruction*.—In the patient with simple obstruction who has considerable distension, which has not responded to suction, the situation is not so simple. The surgeon approaches such a problem with misgivings. It is obvious that during the suction period, an attempt must be made not only to meet the water and electrolyte requirements of the patient. In addition, at least the basal caloric requirements must be met, and the minimal daily protein needs of the patient should be satisfied by plasma or amino acids. The proper preparation of the patient with late simple obstruction is an item of the greatest importance. The special problem of the surgeon in such instances, however, is how best to deal with the problem of distension. For many cases, a simple blind enterostomy meets the requirements of the situation adequately, and temporary external diversion of intestinal gas and fluid permits the bowel to re-establish its continuity automatically. Obstructive adhesive bands, in such instances, are usually the causative agent. If the obstruction fails to relent, a second direct attack upon it may be necessary, at which time, the persistent adhesive band, tumour or obstructing agent can be dealt with under more auspicious circumstances.

However, even in simple obstruction with considerable distension, there are instances in which it is not safe to be content with closure of the abdomen after the establishment of enterostomy. Whereas I have been ardent in the endorsement of "blind" enterostomy, as a satisfactory operation for patients with late simple obstruction, in the last few years I have come more and more to employ aseptic decompression suction enterotomy,^{14, 15} a means by which the element of distension can be managed satisfactorily at operation without soiling. It perhaps is not necessary to emphasize the great importance of

maintaining the sterility of the peritoneal cavity inviolate. Everyone has come to recognize that spillage from the obstructed intestine at operation threatens the life of the patient. Apart from the absence of operative trauma in decompression achieved by the conservative method, it possesses this great advantage, granted the method succeeds, that it does not compromise the sterility of the peritoneal cavity. Aseptic decompressive suction enterotomy has now had wide usage in this clinic and has established itself as a satisfactory therapeutic expedient with which to combat the element of distension. The technique of employment of the method has been described elsewhere. When distension has been overcome, the obstructing agent may be visualized and managed in accord with the needs of the situation.

3. *Acute colonic obstruction*.—Our practice for more than 10 years in dealing with acute obstruction of the colon is to establish the decompressive vent in the transverse colon. The x-ray film is ordinarily an excellent guide in determining the extent of distension as well as the length of the colon involved in the distension; furthermore, such a film affords orientation on the location of the distended transverse colon with reference to the umbilicus, a five cent piece being taped over it. A transverse incision is made directly over the colon, permitting a loop of the distended transverse colon to herniate out. Only after careful closure of the abdominal wound, including the skin, is the bowel tapped with a fine needle attached to a source of suction. After a few days, the protruding colon may be opened up to establish complete faecal diversion, if deemed desirable, prior to a direct operative attack upon the obstruction, which most frequently is a carcinoma of the pelvic colon.

If the obstruction were in the ascending colon, obviously a decompressive vent distal to it would be out of place. In such an instance, the cæcum would have to be tapped directly; or a catheter placed in the terminal ileum could be inserted through the ileocæcal valve into the distended cæcum. Over a period of many years, decompression of the distended transverse colon in obstruction of the colon has been preferred to cæcostomy. In the presence of great distension, it may be extraordinarily difficult to tap a distended cæcum effectively without spillage. And soiling is too often synonymous with peritonitis.

4. *Strangulating obstruction*.—The need for early surgery in strangulating obstructions is obvious. The bowel must be rescued from entanglement by the adhesive band or other mechanism which threatens its viability; if the bowel is non-viable it must be excised. Whereas in former years excision with primary anastomosis was limited largely to strangulating obstructions involving the upper half or two-thirds of the small intestine, the success that Dennis, in this clinic, has had with primary resection for strangulating obstructions in the lower ileum, suggests it as a proper choice of operative procedure in practised hands. Aseptic decompressive suction enterotomy is an important aid in dealing with the item of distension preparatory to excision of the devitalized bowel. In volvulus of the sigmoid colon, exteriorization and excision of the gut which has undergone torsion obviously is the operative procedure of choice.

THE MORTALITY OF OBSTRUCTION

As emphasized earlier in this paper, the two groups of cases which still loom large in accounting for the mortality of obstruction, are: (1) patients with great distension of the small intestine, not relieved by suction applied to an indwelling tube; (2) strangulating obstructions. The suction method of dealing with intestinal distension has taught us the great virtue of relieving the distension without contaminating the peritoneum. Surgeons now must learn to deal more effectively with the distension of obstruction by *operative means*. The problem in the colon is relatively simple. Surgical decompression of the transverse colon has done away with the hazard of contaminating the peritoneal cavity inherent in tapping the distended colon by cæcostomy. Dennis (1944) in surveying the acute obstructions of the colon due to carcinoma in this clinic over a 6-year interval, found that the mortality of transverse colostomy for acute obstruction of the colon was 7.9%. Three of 38 patients died; in the fatal cases, perforation already was present in two at the time of operation, and the third died of a gastric haemorrhage from a duodenal ulcer.

With reference to the item of distension, the greatest need for improvement lies with the difficult problem of distension of the small intestine. Earlier operative intervention in some instances will help. In other words, procrastination with suction, which eventually proves inadequate, constitutes an item in contributing to

mortality. Considered thought must be lent to this intricate and difficult problem of great distension of the small intestine. It should be possible to salvage almost every patient with *simple* obstruction, yet there are many pitfalls. Precision technique is mandatory.

How the procedure is done is just as important as what is done.—When will we be able to deal with the conditions causing obstruction, with risks not far out of line, presented by those same causes, when obstruction is not present? Dennis and Brown (1943) found that the mortality of obstruction of the small intestine in this clinic over the two year preceding interval was 11.3%. Real improvement has occurred generally in the mortality figures of bowel obstruction, but there is considerable room for betterment. What satisfaction we can have in this achievement should be only a stimulus to improve the quality of the record.

THE PRESENT PROBLEM IN OBSTRUCTION—

A SUMMARY

The successful prosecution of any problem demands the following: (1) a knowledge of the facts relating to the problem; (2) a need of looking at the problem rationally; (3) prosecuting the mode of action decided upon with vigour. A study of the difficulties hedging about the bowel obstruction problem suggest the following items as being largely responsible for continuance of the present mortality:

1. Late diagnosis.
2. Delay in hospital, occasioned by: (a) failure to recognize the presence of obstruction; (b) improper identification of the type of obstruction present; (c) treating patients by suction too long before recourse to operation.
3. Failure to prepare patients adequately for operation: (a) inadequate water and electrolyte replacement; (b) inadequate replacement of blood volume losses in strangulating obstructions; (c) failure to meet the caloric and nitrogen requirements of starved patients.
4. Improper choice of therapeutic procedure: (a) employment of suction in presence of strict contraindication or too protracted use of suction, in patients presenting relative indications for its use; (b) poor choice of surgical procedure.
5. Faulty technical execution of surgical procedures, especially failure to perform an aseptic operation, in which no suggestion or evidence of spillage of intestinal content occurs.
6. Uncontrollable factors: (a) obstructions, inherently difficult to deal with, such as congenital intestinal atresia or strangulated incisional hernias in obese patients with poor cardiac reserve; (b) old age and its physical infirmities which contribute to operative mortality; (c) great intestinal distension; (d) strangulating obstructions.

With reference to item (c), listed under uncontrollable factors, it is to be remembered that in every instance of intestinal obstruction at

some stage, the distension was not great. The error, therefore, in a sense is one which could be avoided, granted, (1) early diagnosis, and (2) successful application of the correct therapeutic procedure. Similarly with item (d), granted early diagnosis and early and technically correct execution of the proper operative procedure, the problem of strangulating obstruction should not be so formidable. For, after all, with the single exception of mesenteric embolism or thrombosis, granted early operative release from the strangulating agent, all forms of strangulating obstruction may be treated as instances of simple obstruction.

Concentration of the responsibility for management of patients with acute intestinal obstruction, in the hands of a few persons of each hospital staff, would augment considerably the general accomplishment in the problem. The important therapeutic problem in bowel obstruction is to achieve decompression before the ill effects of sustained increase in intraluminal pressure has impaired the viability of the bowel wall, causing increased capillary permeability. A small group in each hospital, who set themselves the task of wrestling with the problem, would soon make every hospital staff obstruction-minded.

A better knowledge of the effects of obstruction; a more acute appreciation of the criteria which permit timely recognition of the presence and identification of the type of obstruction; and, finally, a more discerning understanding of the limitations and virtues of the available remedial agents, together with a keener interest in the technique of carrying out therapeutic precepts with precision—these are the important items in the bowel obstruction problem.

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NUTRITIONAL AND ENVIRONMENTAL STUDIES IN SOUTH EAST ASIA*

By Lieut.-Col. Robert Kark, R.C.A.M.C.†

with the technical assistance of

Lieut. H. F. Aiton, R.C.A.M.C.

and

C.S.M. E. D. Pease, R.C.A.M.C.

THE campaign against the Japanese in Burma was fought under conditions which tended to produce environmental and nutritional disturbances among military personnel on both sides. The hot, humid climate, endemic malaria and dysentery, and especially, the long supply line, which was among the most difficult in the history of warfare, were all contributing factors.

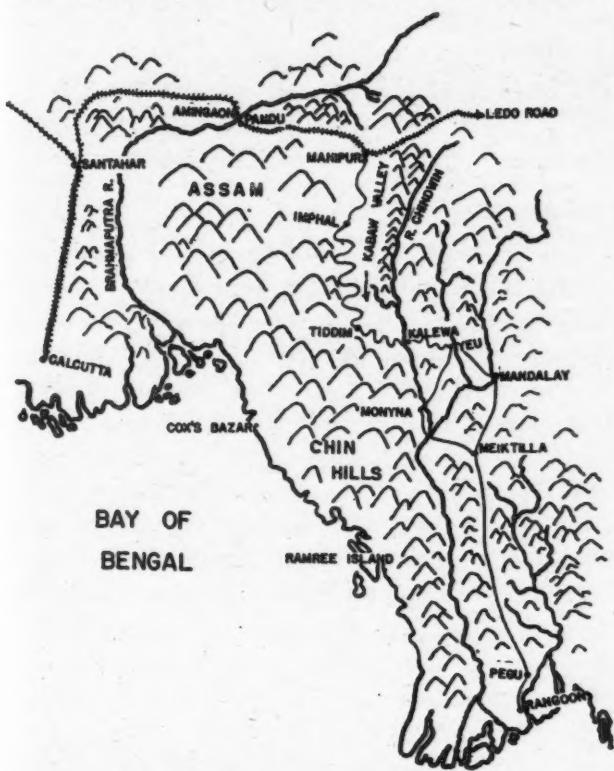
Prior to 1942 there was no direct road from India into Burma and the sea route was the normal channel for commerce. With the capture of Burma by the Japanese, a makeshift tortuous thousand-mile supply route had to be developed over mountainous jungle country (see map). Supplies arriving from all over the world at the Calcutta base were shipped up a single track, broad-gauge railway, unloaded at Santabar and transported on a narrow-gauge track to Amingaon, on the banks of the Brahmaputra river. Here the loaded box-cars were ferried singly across the river and shipped on the Ledo Railway to the Dimapur Base supply dumps. The last haul on army trucks was by far the worst, down the tortuous, rough Manipur Road, which Indian Pioneer Corps labour had forced through the jungle of the precipitous Assam Hills and the malarious Kabaw Valley.

At the best of times it took relatively mobile parties of men 10 to 14 days to travel from Calcutta to the forward areas, and it was not surprising that in the early part of 1944, nutritional deficiency was observed among Indian soldiers of the 14th Army. Later in the year, South East Asia Command requested the Canadian Government to make available a small unit to study environmental and nutritional problems in the field, and an R.C.A.M.C. Research Team equipped with a portable biochemical laboratory¹ was, therefore, flown out to South East Asia.

* From the Research and Development Division of the Directorate General of Medical Services, N.D.H.Q., Ottawa, Canada.

† Officer Commanding, Canadian Research Team, A.L.F.S.E.A.

In Burma, the research team made observations on the activity and environment of 23 different units, and clinical, nutritional and biochemical examinations were done on over 1,000 Indian soldiers. In addition physical fitness tests were carried out on some of the men; a group of Japanese prisoners of war were studied; the special problems of tank crew feed-



Map of Burma showing rail and road supply route to 14th Army (1944-1945).

ing during operations were investigated; and compact boxed military rations, produced in India, were tested for military usefulness and ability to maintain fitness and nutritional balance in the field.

The biochemical estimations included measurements of blood haemoglobin, serum chloride, serum protein and serum vitamin C. The excretion of chloride, vitamin C, thiamine, riboflavin and methyl nicotinamide in the urine was also measured.

Observations were made in the field on the amount and types of food ingested, on wastage and shortages of ration items, on food preparation, on the acceptability of various types of food supplied to the Indian soldier and on the effects of religious and racial prejudices and habits on nutrition.

This report presents in condensed form some of the results obtained. Detailed analyses have been reported to the Associate Committee on

TABLE I.
THE AVERAGE NUTRITIONAL BIOCHEMICAL STATUS OF 1,000 INDIAN SOLDIERS COMPARED WITH JAPANESE AND CANADIAN AND U.S. ARMY SOLDIERS

	Japanese soldiers	Indian soldiers	Canadian and U.S. Army soldiers
Hæmoglobin gm./100 ml.	12.0	14.4	16.8
Serum protein gm./100 ml.	5.6	5.7	6.4
Serum chloride, meq./L.	98.1	100.0	105.0
Urine chloride, gm./hr. (fasting)	0.7	0.5	0.7
Serum vitamin C, mgm./100 ml.	0.1	0.13	0.8
Urine vitamin C, mgm./hr. (fasting)	0.6	0.4	0.8
Urine thiamine, mcg./hr. (fasting)	9	13	13
Urine riboflavin, meg./hr. (fasting)	4	10	41
Urine M. nicotinamide, mgm./hr. (fasting)	0.6	0.5	0.5

Army Medical Research, N.R.C., Canada^{2 to 6} and will be published in due course.

DIETARY HABITS OF THE INDIAN SOLDIER

During the years of peace, the majority of soldiers in the Indian Army were recruited from the so-called martial classes, who are usually of high caste and of good physique. Since the war, with its expansion to a force of about 3,000,000 men, volunteers from all classes and castes have been accepted and although the Indian Army contains a small percentage of Christians and some vegetarians, like the Jats, who will not even eat eggs, the majority of the soldiers are Hindus and Mohammedans whose nutrition is disturbed by meat-eating taboos.

The Hindus and Sikhs, to whom the cow is sacred, abhor beef and the flesh of female animals, and slaughter by "jhatka".* The Mohammedan soldiers, on the other hand, who are usually more orthodox in maintaining their religious dogmata than the Hindu soldier, abhor pork and will only eat "hallal" meat.†

Practically speaking male goats, rams and chickens are the only animals acceptable to all the meat-eating people of India. However, as the majority of Indian soldiers are extremely suspicious of carcass meat, it is the custom in India to supply training centres with male goats "on the hoof" for regimental slaughter and

* Jhatka slaughter is done with a heavy knife or sword, the blow striking across the throat and chest and usually decapitating the animal.

† The blood vessels of the neck of the animal are incised with a razor-sharp knife and the animal quickly bleeds to death. Non-ruminants and certain classes of birds and fish are taboo and may not be eaten or even touched.

consumption. Unfortunately it was extremely difficult and practically impossible to get live animals up the long "L. of C." to the troops in the forward areas as most of them died during the journey, while air transport of live animals was impracticable.

Since sufficient numbers of male goats could not be obtained from local sources in Burma or Assam, dehydrated male-goat meat was prepared and canned in India for consumption in the field. Despite the fact that the animals had been killed ritually in India and despite the fact that the cans were labelled with the picture of a goat having an enormous pathological enlargement of the testes, the Indian troops were not quite satisfied that all was well, and, as the product was also unpalatable, very little was consumed.

All in all, the amount of meat eaten by the Indian soldier in the 14th Army was negligible, and the total animal protein supplied each day (mainly evaporated milk with a little canned fish) was between 10 to 25 gm. When one takes into account preparation and other types of wastage and spoilage, the dietary intake of animal protein was very low.

Cereals are the staple foods of the Indian; the northern Indian eats atta (whole wheat) while his brothers who live in the south and east eat rice, and a few live on maize or millet. Because of the nutritional superiority of atta and because of the shortage of rice, the Army has tried to make the rice eaters eat atta, and though this has met with some success, we were able to find

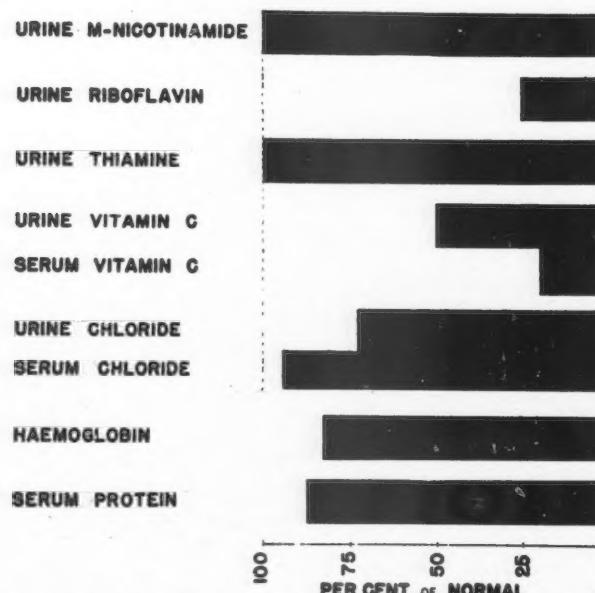


Fig. 1.—The biochemical nutritional status of 1,000 Indian soldiers—14th Army, Burma, compared with Canadian and U.S. Army Infantry ("normal" levels).

biochemical differences between rice-eating and atta-eating soldiers (see Fig. 2 and Table II).

TABLE II.
THE BIOCHEMICAL NUTRITIONAL STATUS OF
INDIAN SOLDIERS

Substance	% of soldiers with evidence of chemical inadequacy	
	Moderate	Severe
Hæmoglobin.....	11	5
Serum protein.....	15	0
Chloride.....	7	4
Vitamin C.....	41	3
Riboflavin.....	79	0
Thiamine.....	2	0
Methyl nicotinamide.....	7	0

All types of vegetables, fruit and dried peas ("dal") are enjoyed by Indian soldiers. In the 14th Army vegetables were invariably cooked into curries, bubbling for hours in a hot mixture of water and ghi.*

Imported canned foods were introduced to the Indian soldier early in the war. These were quite novel to him, as India does not have a large canning industry. Fortunately, he enjoyed and accepted canned vegetables and fruits, evaporated milk, salmon and sardines. Canned cheese, jam and Canadian pilchards were not popular and meat products like "bully", sausage, and stews, occasionally were eaten surreptitiously by some of the lower caste Hindus.

The Indian soldier starts his day (0500-0600 hrs.) with sweet milky tea, and in some units chipatis (flap jacks made with atta) are eaten. At about 1100 hrs. he has his mid-day meal of chipatis or rice with vegetable curry. At 1400 hrs. tea is again brewed up and in the evening, at 1730 hrs., he has his big meal of chipatis or rice, with a vegetable curry to which fish, eggs or meat are added, when they are available. Fruit, whether tinned, fresh or dehydrated was usually eaten with this meal. In each company of men, the various religious groups or castes run their own kitchen and do their own cooking. The Indian Army Medical Corps believes that these habits are not conducive to physical efficiency and has tried to introduce a three-meal-a-day schedule, but this has met with very little success.

Generally speaking, the Indian soldier on active service, although he accepts and enjoys some canned foods, has largely retained his in-

* Ghi is, properly speaking, clarified butter made from soured milk. During the war years it was heavily diluted with vegetable fats and contained little or no vitamin A.

grained taboos and prejudices about his food and cooking habits. Unfortunately in many units these habits are accentuated by commanding officers and other officers, with the idea of fostering regimental tradition. In the great majority of cases, such commanding officers are unaware of the nutritional harm that is so frequently the result of these bad habits. The reluctance of the Indian soldier to eat meat; the reluctance of the Madrassi to eat atta; his habits of cooking rice in too much water; and the general habit of over-cooking vegetables at very high temperatures are cases in point.

PHYSICAL AND BIOCHEMICAL EXAMINATIONS OF INDIAN SOLDIERS

After the 1944 monsoon season, air transport of matériel of war, to forward units, by British Canadian and U.S. air crews, really came into its own, and the food supply situation improved considerably. Consequently florid cases of beri beri, nutritional neuropathy and pellagra were not encountered among troops in the field and, in the hospital patients, nutritional disease was nearly always secondary to diarrhoea or other illnesses.

GENERAL HEALTH

On examination the majority of the Indian soldiers were fit and well. They were, generally speaking, very lean, and while their musculature and general development was inferior by British and North American standards, their muscle tone was excellent. Where environmental stress had existed, as in the men of some animal transport units and to a lesser extent in certain infantry regiments, some of the men were thin, haggard, fatigued and anaemic. In these units too, a large number of the Indian soldiers spontaneously complained of their health.

Skin conditions such as septic insect bites, septic thorn scratches, boils, carbuncles and fungus infections were seen but were not very prevalent.

Throughout, gross physical abnormalities were not noted. Two soldiers suffering with haematuria and three with pyuria were discovered as a result of routine urinalysis and admitted to hospital.

NUTRITIONAL EXAMINATION AND BIOCHEMICAL FINDINGS

Stigmata of nutritional disturbances.—The percentage of Indian soldiers with stigmata of nutritional disturbance is shown in Table III.

TABLE III.
THE PERCENTAGE OF INDIAN SOLDIERS WHO SHOWED STIGMATA OF NUTRITIONAL DISTURBANCE

	%
Proliferative eye lesions:	
Marked active eye lesions.....	5
Marked chronic eye lesions.....	9
Mild lesions (nearly all chronic).....	41
Folliculosis.....	7
Corneal blood vessel invasion.....	17
Angular stomatitis.....	7
Cheilosis.....	6
Glossitis.....	7
Miscellaneous lesions.....	4
Good oral hygiene.....	31
Fair oral hygiene.....	35
Poor oral hygiene.....	34

On clinical grounds, it would appear that the diet taken by the Indian soldier has been somewhat deficient in riboflavin and vitamin A, for large numbers of the men examined presented signs or symptoms attributable to deficiency of these vitamins. However, the majority of the proliferative lesions of the conjunctiva and cornea which we examined were old lesions which, according to the histories given, dated from childhood and adolescence. These lesions have been described in detail elsewhere⁵ and it is our opinion that while they may be produced by nutritional deficiency, be it lack of vitamin A or part of the B complex, environmental factors played a part in its production.

Where environmental stress existed symptoms were observed which were indistinguishable from those which occur in vitamin B complex deficiency diseases, while some of the Indian soldiers in these and other units presented signs and symptoms of anaemia, chloride deficiency and chronic caloric deficiency.

BIOCHEMICAL FINDINGS

General.—The biochemical findings which are recorded in Tables I, II and IV are also shown in Figs. 1 and 2. These, when compared with Canadian and U.S. Army standards show that major inadequacies existed in vitamin C and riboflavin levels. The haemoglobin and protein levels were also below par, and in the rice-eating Indian soldiers thiamine excretion levels were not very satisfactory. In some units chloride inadequacies existed.

Haemoglobin.—The average haemoglobin levels of the Indian soldier in the 14th Army was only 85% of the average normal European level (16 gm./100 ml.), moreover only 57% of the Indian soldiers studied had haemoglobin levels which fell within the mean levels for Europeans (14.8 to 17.4 gm./100 ml.). Of the remainder (43%),

TABLE IV.
THE BIOCHEMICAL NUTRITIONAL STATUS OF DIFFERENT INDIAN RACES AND RELIGIONS

	Race and religion							
	All	Maharattas —Hindu	Madrassis —Hindu	Mixed Christians	All	Jat —Hindu	Punjabi —Muslim	Sikh —Sikh
Staple cereal.....	Rice	Rice	Rice	Rice	Atta	Atta	Atta	Atta
Hæmoglobin, gm./100 ml.....	15.5	15.8	15.8	15.5	14.2	13.7	14.5	14.4
Serum protein, gm./100 ml.....	5.7	5.5	5.6	5.7	5.7	5.9	5.8	6.0
Serum chloride, meq./L.....	105.0	107.0	104.0	103.0	100.0	98.1	99.4	99.9
Urine chloride, gm./hr. (fasting).....	0.7	0.8	0.6	0.7	0.4	0.3	0.3	0.5
Serum vitamin C, mgm./100 ml. (fasting).....		0.1	0.1	0.1	0.1	0.1	0.1	0.1
Urine vitamin C, mgm./hr. (fasting).....		0.3	0.3	0.3	0.4	0.3	0.4	0.6
Urine Thiamine, mcg./hr. (fasting).....		6.0	5.0	6.0	8.0	14.5	11.0	12.0
Urine riboflavin, mcg./hr. (fasting).....		15.0	22.0	10.0	14.0	5.0	5.0	6.0
Urine methyl-nicotinamide, mgm./ hr. (fasting).....		0.35	0.15	0.36	0.56	0.5	0.32	0.33
								0.30

16% were anæmic. It may also be noted that during the first two years of service in the 14th Army the average hæmoglobin level dropped by 1.4 gm./100 ml. While this may be attributed in part to malaria and hookworm infestation, the negligible quantities of meat which the Indian soldier had while he was on active service in this theatre was also a contributing factor. In confirmation of this, it will be seen that Jats (Table IV), who were strict vegetarians, had

the lowest average hæmoglobin levels of any of the racial or religious groups studied.

In passing it may be noted that Madrassi and other rice-eating Indian soldiers have a significantly higher hæmoglobin level than atta-eating Indian soldiers (Fig. 2 and Table IV). This fact may or may not have some bearing on the current theory that atta contains a substance which interferes with the production of hæmoglobin.

Serum protein.—The average serum protein of the Indian soldier (5.7 gm./100 ml.) is 88% of the normal average level (6.6 gm./100 ml.); 39% had protein levels which fell within mean normal blood levels (6.0 to 7.3 gm./100 ml.) and 15% had levels of 80% or less. One soldier had œdema of his legs and a protein level of 4.3 gm./100 ml.

The low level of protein is almost certainly the result of inadequate nutrition in civilian life and while the Indian soldier may have improved somewhat on army rations, the inadequate supply of animal proteins (especially fresh meat) which were made available to him by the army had not brought his protein and hæmoglobin up to a normal level.

Serum and urinary vitamin C.—The low serum and urinary vitamin C levels can be attributed to three factors. Firstly, fresh fruit and vegetables were in short supply during the early part of the year, and secondly, units under-drew their ration allowance of these items. The third factor, which is probably the most important, is that, while some of the vitamin C available was spoiled by improper handling and storage of vegetables and fruit en route from the rear airbase to dumps and depots, a large amount was destroyed in the cookhouse by bad

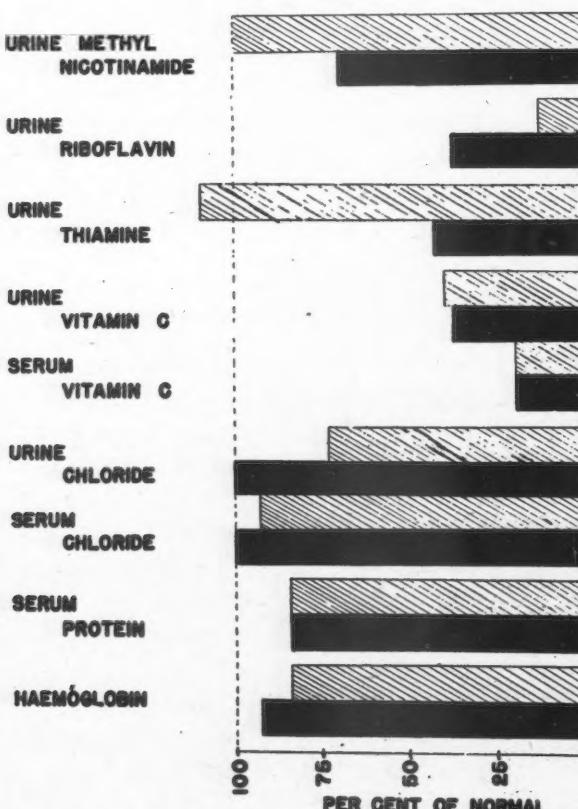


Fig. 2.—The biochemical nutritional status of rice-eating Indian soldiers (black) and atta-eating Indian soldiers (shaded) compared with each other and with Canadian and U.S. Army Infantry ("normal" levels).

methods of preparation and cooking. Many of the cooks in the units studied were only partially trained. Fresh vegetables were sometimes kept for a day or more before they were used and they were nearly always cooked for some hours at a high temperature in ghi mixed with water.

Urinary riboflavin.—Practically the only sources of riboflavin available to the Indian soldier was in evaporated milk, and atta. Evaporated milk usually was taken with tea and when used in this way some was invariably wasted. Madrassis and other rice eaters often added part of their milk ration to their rice and so wasted less milk. Their urinary riboflavin levels consequently were higher than in atta eaters (see Table IV and Fig. 2). But, none the less, the average urinary output of riboflavin of all Indian soldiers was very low when compared with North American standards and, when judged by those standards, over three-quarters of the Indian soldiers had biochemically inadequate levels. Furthermore a number of Indian soldiers had clinical signs of ariboflavinosis. If a slit-lamp had been available it is quite probable that considerably more men presenting lesions of riboflavin deficiency would have been discovered.

It is not surprising that the situation with regard to riboflavin was not satisfactory, as analyses of ration issues show that the most the Indian soldier was getting was one-third to one-half of his daily requirement of this vitamin. The ration provided a little more but units generally speaking did not obtain the tinned milk available to them, in lieu of the non-existent meat ration. The reason for this was that units usually had enough milk for tea from the standard milk ration and unit cooks did not have the initiative or training to use extra tinned milk in cooking.

Urinary thiamine.—The average thiamine level was excellent, but while the thiamine levels were well above normal in the atta-eaters they were rather low in the rice-eaters (see Fig. 2). When environmental stress existed thiamine levels were low even in atta-eating Indian soldiers (thiamine levels in atta-eating Indian soldiers 14.5 mcg./hr.; with environmental stress, 8 mcg./hr.).

Urinary N¹-methyl nicotinamide.—Urinary excretion of this substance was generally speaking at a high level.

Urinary and serum chlorides.—On the whole the levels of urinary and serum chlorides were

fairly satisfactory, especially in units who salted their water or their atta. The commanding officers of these units understood the importance of adequate salt intakes for hard working troops in hot environments, and ensured that the salt was taken. In other hard working units, such as the mule transport companies and in two tank regiments, there was either a lack of knowledge or a failure to implement this knowledge. In these units the average chloride levels were low, many of the men had severe chemical inadequacies, and salt and water disturbances occurred.

ENVIRONMENTAL STRESS, HEALTH, AND NUTRITIONAL STATUS

A detailed study of the effects of environment on the health, physical fitness and nutrition of

TABLE V.
THE PERCENTAGE OF INDIAN SOLDIERS IN A MOTOR TRANSPORT COMPANY AND TWO ANIMAL TRANSPORT COMPANIES, ROYAL INDIAN ARMY SERVICE CORPS, WHO SHOWED STIGMATA OF NUTRITIONAL DISTURBANCES

	Motor transport soldiers	Animal transport soldiers
Proliferative nutritional eye lesions:	%	%
(i) Marked active eye lesions...	10	9
(ii) Marked chronic eye lesions...	3	3
(iii) Mild lesions (usually chronic)	37	45
Folliculosis	7	6
Corneal invasion (Limbic vessels)	13	20
Angular stomatitis	3	18
Cheilosis	7	14
Magenta glossitis	3	9
Riboflavin skin lesions	0	3
Good oral hygiene	54	36
Fair oral hygiene	33	24
Poor oral hygiene	13	40

TABLE VI.
THE AVERAGE BIOCHEMICAL STATUS OF INDIAN SOLDIERS IN A MOTOR TRANSPORT COMPANY AND TWO ANIMAL TRANSPORT COMPANIES, R.I.A.S.C., AS COMPARED WITH CANADIAN AND U.S. INFANTRY

	Motor transport soldiers	Animal transport soldiers	Canadian and U.S. infantry
Serum protein, gm./100 ml.....	6.1	5.7	6.4
Hæmoglobin, gm./100 ml.....	14.9	13.1	16.8
Serum chloride, meq./L.	102.0	98.6	105.0
Urine chloride, gm./hr. (fasting).....	0.5	0.2	0.7
Serum vitamin C, mgm./hr.....	0.2	0.1	0.8
Urine vitamin C, mgm./hr. (fasting)...	0.2	0.2	0.8
Urine thiamine, mcg./hr. (fasting)...	8.0	8.0	12.0
Urine riboflavin, mcg./hr. (fasting)...	38	18	41
Urine M-nicotinamide, mgm./hr. (fasting)...	0.5	0.38	0.5

TABLE VII.
THE BIOCHEMICAL NUTRITIONAL STATUS OF INDIAN
SOLDIERS IN AN ANIMAL TRANSPORT COMPANY AND
TWO MOTOR TRANSPORT COMPANIES, ROYAL INDIAN
ARMY SERVICE CORPS

	% of men with evidence of moderate and severe chemical inadequacy			
	Moderate		Severe	
	Motor transport Company	Animal transport Companies	Motor transport Company	Animal transport Companies
Haemoglobin	7	29	3	15
Serum protein...	0	6	0	0
Chloride....	0	26	0	10
Vitamin C...	64	71	0	7
Riboflavin..	2	35	0	0
Thiamine...	0	3	0	0
Niacin.....	0	12	0	0

Indian soldiers, has been reported elsewhere.⁶ In Tables V, VI and VII, differences in clinical and biochemical nutritional status can be seen in two units, both of which had fought in the same campaign in Burma for a continuous period of thirty months, without being relieved. Although both units were supplied with the same rations and both worked at transporting matériel of war from base dumps to the front line, the Motor Transport Unit was not pushed hard. But the soldiers of the Animal Transport Unit were subjected to the stresses of extreme hard work, exposure to sun, wind and rain, skin infections, endemic disease, lack of sleep and lack of rest. Consequently, at the end of this time they were operationally inefficient and had very low Harvard Physical Fitness scores, while the Motor Transport Unit soldiers, although tired, were able to carry on with their work. This study and observations on other units, illustrates the invidious effects of severe and prolonged environmental stresses on the health and fitness of inadequately fed troops. To maintain health and fighting efficiency, under severe conditions in the field, adequate food, as well as close supervision of hygiene is necessary.

JAPANESE PRISONERS OF WAR

Some Japanese prisoners of war captured near Pegu, Burma, were studied in a forward division prisoner-of-war cage. It was thought that such a study would be useful, as it might indicate what type of nutritional disturbances one would expect to find in allied soldiers held captive by the Japanese in S.E.A., and their rehabilitation could be planned accordingly.

The biochemical nutritional status of the prisoners of war can be seen in Table I. Clinically

they presented signs and symptoms of anaemia and of hypo-proteinæmia. One prisoner of war had developed pellagra, following an attack of dysentery. About one-third had had beri beri during their service in Burma but all symptoms and signs had cleared up, except in a few men who still had absent ankle jerks. Marked lesions of ariboflavinosis were present in about 40% of the prisoners of war and this was accompanied by an extremely low urinary riboflavin output.

The low standards of nutrition found in the Japanese prisoner of war is a reflection of the poor medical care given by the enemy medical service in the Burmese theatre of operations.

CONCLUSION

The studies made in Burma on Indian soldiers of the 14th Army by a Royal Canadian Army Medical Corps Research Team produced clinical and biochemical data on their nutritional status and health.

From observations made in the field various factors were discovered which operated against the maintenance of high nutritional standards.

It is believed that the results obtained may be of value in helping to improve the nutritional status of both the Indian soldier and his civilian brother.

SUMMARY

In 1944-45 Royal Canadian Army Medical Corps Research Team conducted nutritional and environmental studies in India and Burma.

Observations were made on the activity and environment of 23 different military units, and clinical, nutritional and biochemical examinations were done on over 1,000 Indian soldiers. In addition, physical fitness tests were carried out on some of the men, a group of Japanese prisoners of war were studied, the special problems of tank crew feeding during operations were investigated, and compact boxed military rations, produced in India, were tested for military usefulness and ability to maintain fitness and nutritional balance in the field.

The biochemical estimations included measurements of blood haemoglobin, serum chloride, serum protein and serum vitamin C. The excretion of chloride, vitamin C, thiamine, riboflavin and methyl-nicotinamide in the urine was also measured.

Observations were made in the field on the amount and types of food ingested, on wastage and shortages of ration items, on food prepara-

tion, on the acceptability of various types of food supplied to the Indian soldier and on the effects of religious and racial prejudices and habits on nutrition.

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RÉSUMÉ

Au cours de 1944-45, le corps de recherches médicales de l'armée canadienne a eu l'occasion d'observer les conditions de vie et de nutrition de l'Inde et de la Birmanie; cette étude a aussi porté sur un certain nombre de prisonniers de guerre japonais. Les tables insérées au texte illustrent bien les divers bilans comparatifs des sujets observés aux points de vue biochimique, vitaminique, nutrition générale et carences spéciales. D'autres tables font entrer en ligne de compte l'influence de la race et de la religion. Ces recherches illustrent bien l'importance du choix des aliments dans la ration alimentaire du soldat en même temps qu'elles indiquent les mesures à prendre vis-à-vis de certaines carences.

JEAN SAUCIER

INTESTINAL PARASITES IN THE
CANADIAN ARMED FORCES*

By T. H. Williams, M.D., C.M.,
D.T.M.&H. (Eng.)†

Winnipeg

REPORTS were received in the fall of 1944 that a fairly high incidence of *Entameba histolytica* and other protozoal infection had been found in limited surveys of personnel returned from Mediterranean areas. Some cases of recurrence of amebic dysentery were encountered in patients in Deer Lodge Hospital. Accordingly a survey was undertaken to determine the prevalence of infection and to sterilize by treatment those found infected. Owing to lack of sufficient bed space the survey had to

* A survey of 500 personnel returned from Mediterranean, Far East, and other subtropical areas.

† Pathologist, Deer Lodge Hospital, D.V.A., Winnipeg; Assistant Professor of Pathology, University of Manitoba; late Professor of Pathology, West China Union University.

depend on the stay in hospital of personnel admitted for other causes. And because of the extreme necessity of clearing beds as rapidly as possible some surveys begun were not completed. If the tests so far done had proved negative patients were not detained in hospital simply to complete three tests. However, a very great majority did complete 3 tests on alternate days.

METHOD

All patients admitted have routine Wassermann tests taken. This makes a good time to ask the patients in what areas they served and if they had suffered from dysentery, malaria, or other tropical disease. For all those who had served in Mediterranean, Far Eastern, or any tropical or subtropical area, a card is filled in giving name, rank, number, ward, and date of admission. These are arranged at the upper part of the card and at the bottom is noted the area of service and any history of malaria or dysentery. In the central area of the card is noted the survey result and the cards are filed as completed. These cards are prepared in the admittance examining room and daily delivered to the pathologist.

Cards are checked on receipt by the pathologist against a card index of former tests to ascertain if the patient has been already surveyed. If so and found negative on three tests the card is not acted upon. If formerly found positive and treated further specimens are requested to ascertain if treatment has been effective and the patient remained clear. Otherwise with new entries a request is sent to the ward on a multigraph form requesting that a sample of faeces be sent to the laboratory on alternate days for three tests marked "For parasites". No oil, bismuth, or barium to be administered during the period of the test.

Wards are supplied with half-pint Atlas ice cream cartons which prove very satisfactory as they do not permit the escape of contents or odour and can be cleanly handled throughout. Name, number and ward are written on each carton lid to obviate mistakes. Recent research has proved that amebæ remain motile and viable longest at room temperature and should not be refrigerated or heated.

On completion of the required three tests, or earlier if pathogens are encountered, a report is sent to the ward. Only on receipt of this completed negative report is the patient allowed

a pass to leave the hospital grounds. Owing to lack of bed space it has not been possible to make strict rules for delivery of all specimens when requested. This is particularly true of transient admissions as for tonsillectomy, etc., and also for cases of haemorrhoidectomy where oil was prescribed following operation, and other similar cases.

Faecal specimens are the most difficult to obtain. Urine and blood specimens can readily be obtained repeatedly but there appears to be unwillingness on the part of patient or of staff to obtain and deliver faecal specimens. Much better co-operation has resulted since we hit upon the idea of refusing week-end or transient passes to leave the hospital grounds to any who had been notified to send specimens and had not obtained a clearance by three negative tests. A weekly list of prohibited persons given to the sergeant-major on Fridays has had a very salutary effect.

Technical method. — In the laboratory the specimens are examined by direct smear in normal saline and in D'Antoni's iodine solution, and are also examined by zinc sulphate flotation if negative by direct smear. Motile specimens are stained by Quesnel's stain which is much more applicable to ordinary use than iron haematoxylin staining. All preparations are made on specially wide 1½" glass slides so that fingers and instrument are not soiled. A square 22 mm. cover slip preparation is entirely searched by use of mechanical stage manipulation. The density of the smear preparation is important as too much material clouds the clarity of definition. The correct lighting is extremely important. Iodine solution must be stored in amber glass bottles and only small amounts in amber dropper bottle put on the work bench at a time, to insure fresh potent iodine stain. Saline also must be changed frequently: it can be the source of artifacts and flagellates.

Criteria in diagnosis. — Motile protozoa are checked for size, method of progression, type of pseudopodia, clearness of ectoplasm, ingested particles and especially ingested erythrocytes, composition and coarseness or fineness of nuclear chromatin and position of karyosome as seen in stained films. Visibility of the nucleus in unstained amoeba indicates *Entamoeba coli*, not *E. histolytica*.

Protozoal cysts are checked for size and shape. Definite rounded end chromatoid bodies in-

cluded in the cyst indicate *Entamoeba histolytica* and this is then checked by counting the nuclei in an iodine-stained preparation of cysts. Culture is not practical in such large numbers of cases in a routine hospital laboratory.

The stool is examined for blood and mucus and consistence. The patient is seen and questioned as to dysentery history. Sigmoidoscopic examination is done where indicated.

TABLE I.
PARASITES FOUND IN 500 PATIENTS

Parasite	Present in	Percentage incidence
<i>Entamoeba histolytica</i>	65	13.0
<i>Entamoeba coli</i>	109	21.8
<i>Endolimax nana</i>	30	6.0
<i>Iodamoeba butschlii</i>	10	2.0
<i>Giardia lamblia</i>	37	7.4
<i>Trichomonas hominis</i>	2	0.4
<i>Chilomastix mesnili</i>	1	0.2
<i>Ascaris lumbricoides</i>	3	0.6
<i>Enterobius vermicularis</i>	1	0.2
<i>Trichuris trichiura</i>	8	1.6

TABLE II.
MIXED INFECTIONS IN 65 PATIENTS

<i>E. histolytica</i> alone.....	29
<i>E. histolytica</i> and <i>E. coli</i>	22
<i>E. histolytica</i> and <i>E. nana</i>	5
<i>E. histolytica</i> and <i>iodamoeba butschlii</i>	2
<i>E. histolytica</i> and <i>Giardia lamblia</i>	5
<i>E. histolytica</i> and <i>trichomonas hominis</i>	1
<i>E. histolytica</i> and <i>ascaris</i>	1

TABLE III.
PERCENTAGE OF INFECTION WITH ENTAMOEBA HISTOLYTICA FROM VARIOUS AREAS OF SERVICE

Area	Number examined	<i>E. histolytica</i> present	Percentage
Italy and Sicily.....	397	47	11.87
North Africa.....	21	6	28.57
India.....	48	7	14.58
Ceylon.....	11	2	18.17
Europe.....	6	1	16.66
Other areas, subtropical	17	2	11.76

DISCUSSION

The finding of flagellates would probably be higher if warm freshly passed specimens were the rule. A heavy infection with *Giardia lamblia* was frequently the only finding in patients who complained of recurring attacks of looseness of stools. In this connection I have long been convinced that *Giardia lamblia* can be and is mildly pathogenic in certain types of individual. Since treatment with atebrin, 0.1 gram t.i.d. p.c. for 5 days usually clears the infection, we have administered it to these patients.

All of those surveyed who had served in India and Ceylon were R.C.A.F. personnel and these attended as outdoor clinic patients and passed the specimens at the clinic. I feel that the higher incidence of *E. histolytica* in these was at least in part due to the immediate examination of fresh warm specimens.

There was a very high incidence of infection in returned personnel from North Africa.

History of dysentery during service means little, as almost 100% reported dysentery, diarrhoea, "gippy tummy", or some such abdominal upset.

We were surprised at the few helminth infections encountered. Of these *Trichuris trichiura* (whipworm) was most frequently found. This is a difficult helminth to eradicate but fortunately is of little or no pathological significance. In the personnel recently returned from Hongkong and Japanese prison camps we are finding a very high percentage infected with *Ascaris lumbricoides*. This series will be reported later.

Unlike helminth ova protozoa do not recur daily in the stools but may appear irregularly in large numbers. It has seemed to me that weather and atmospheric conditions have some influence on the appearance of protozoa in the stools. This relationship of meteorological data and disease has been long and ably championed by Sir Leonard Rogers and is dealt with at length in *The Weather and the Patient* by Petersen. Certainly in our own findings *E. histolytica* cysts had a definite tendency to be clumped strongly and not spread evenly over the calendar. Because of these things the more specimens examined from each patient over a greater length of time the more infections will be found. Owing to the press of bed space and impatience of apparently healthy men to leave hospital after treatment for various minor ailments it was not possible to do more than three examinations on alternate days. Of those found harbouring *E. histolytica*: 60% were discovered on the first examination; 26% were added on the second examination; 14% were picked up on the third examination. Had more examinations been done more positives would have been found in a diminishing ratio. Amoebiasis has been previously a rare disease in Manitoba and patients referred to the author in consultation over a period of years have almost invariably obtained the infection abroad. Consequently we doubted statements that an appreciable percent-

age of the local population would be found to be carriers of *Entamoeba histolytica* cysts. To get positive data on this with the co-operation of the R.C.A. and R.C.A.F. we obtained three specimens on alternate days from 100 personnel who had been recently enlisted and had not left Canada for service abroad. This we believe to be the first such survey made in Manitoba and it bears out the belief that *E. histolytica* infection is rare here. *E. coli* on the contrary varies little from that found elsewhere as I have previously observed.

TABLE IV.
INTESTINAL PARASITES FOUND IN 100 ENLISTED
PERSONNEL IN MANITOBA

Parasite	Present	Percentage
<i>Entamoeba histolytica</i>	2	2.0
<i>Entamoeba coli</i>	22	22.0
<i>Endolimax nana</i>	2	2.0
<i>Giardia lamblia</i>	4	4.0
<i>Chilomastix mesnili</i>	1	1.0

One of the two *E. histolytica* carriers had spent 2 years in the southern U.S.A. recently. The other was transferred before I had time to interview him.

A survey of 414 persons in Saskatchewan made in 1939 by Miller¹ showed 4 persons infected with *E. histolytica*. A survey of 500 enlisted Canadian Forces personnel in Quebec made in 1943 by Bews and Choquette² showed 5 infected with *E. histolytica*.

These figures bear out my belief that the incidence of pathogenic amoeba in Canada is in the vicinity of 1%. Many of these persons when questioned will prove to have recently sojourned in indigenous areas of amoebiasis abroad and probably obtained the infection there.

During this survey it has been clearly shown that no procedure of examination of specimens for protozoa can equal the proficiency gained by experience in recognition of the various protozoa and cysts. Repeatedly the author, who has had long experience in the tropics and carried out surveys there, would discover in direct smears protozoa missed by an excellent technician using zinc flotation procedure. As Craig says there is no formula which can take the place of experience. It also seems to me that zinc sulphate flotation alone is not very suitable for flagellates. However it is a useful procedure and has proved its worth as an additional method.

TREATMENT

Our routine treatment has been as follows:

1. One grain of emetine hydrochloride given intramuscularly once per day for 6 days, varying the site of injection each dose as one muscle repeatedly injected becomes sore.
2. Carbarsone 0.25 gm. in capsule. One capsule morning and evening after meals for 5 days.

[1 and 2 may be given concurrently except in debilitated patients if saving of time in hospital is desirable. Watch for arsenic idiosyncrasy.]

3. Five days' interval with no medication.

4. Repeat carbarsone as above for 5 days.

5. Check two specimens for clearance and repeat check three months later if possible. A very good alternative treatment which has a lower toxicity is diodoquin (Searle) in tablets 3.2 gr. Give 2 or 3 tablets three times per day after meals for 16 to 20 days.

The above treatment with emetine and carbarsone has been uniformly successful and rechecks after a lapse of months have shown no reappearance of cysts. It clears *E. histolytica* better than *E. coli* which is not cleared when the two are associated.

SUMMARY

A survey of intestinal parasites has been carried out on 500 enlisted personnel patients returned from Mediterranean and Far Eastern areas. On examination by an experienced parasitologist by direct smear and zinc sulphate flotation of three specimens on alternate days 13% were found to be voiding *E. histolytica* trophozoites or cysts. Treatment as detailed above was found effectual in ridding patients of both trophozoites and cysts of *E. histolytica*.

Helminths were encountered in very few patients.

By comparison a survey of 100 enlisted personnel not having left Canada for overseas revealed only two carriers of *E. histolytica* and one of these had recently returned from an endemic area of amoebiasis. This contrasts strongly with results found in personnel returned from overseas.

The necessity to be on the watch for cases of amoebiasis is evident.

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THE WEAK BACK*

By Colonel A. B. Walter, R.C.A.M.C.

Consultant in Medicine,
D.G.M.S. Directorate, Ottawa

THERE is a region of the body, bounded above by the lowest ribs, below by the pelvic girdle, in front by the posterior abdominal wall and behind by the "small of the back" which from time immemorial has been the source of more complaint from man and woman than perhaps any other part of the body. Its pains have been the fortune of generations of liniment makers, of advertisers, of spas, of manipulators guided and misguided. Only by science has it been neglected; lacking cultivation it has remained a weed patch. It is to this weed patch that my paper is confined, to the semi-obscure origins of aches and afflictions that take the edge off health and strength, but do not wholly maim nor kill.

Extrinsic origins of backache are not included, nor are major and well authenticated lesions such as spondylitis, tuberculosis, sclerosis, cystic disease and metastatic tumours of bone. These and such other gross disorganizations as spondylolisthesis and joint dislocations are open to diagnostic confirmation by laboratory and radiographic findings. Within the past decade the deranged intervertebral disc has been identified as a lesion, and its clinical picture is being clarified, bringing a surge of renewed interest in lumbar syndromes.

This list of more clearly envisioned diseases, incomplete as it is, may seem impressive, but its aggregate of victims is trifling compared with that of the ill-defined lumbar disabilities which receive no more satisfactory diagnosis than "backache", or now "low back pain".

These provide our discussion; they appear to come under not more than three main headings in classification—developmental defects, trauma, and one example of inflammation; and the classification is dimmed by inter-relation of effects.

We know all too little about the physiology and pathology of the somatic tissues in the lumbar region, and have little opportunity of gaining direct knowledge; there are no laboratory and radiographic criteria to help us; we have to fall back on deduction for an understanding of what goes on there; as in Kipling's

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conference "obliquely and by inference illumination comes".

What views this paper presents are of that structure. It is not the strongest on which to build, for one is never sure of having included all factors bearing on deduction, nor of applicable factors yet unknown, but at least it builds a legitimate basis for action by trial and error.

Within our subject region there are not many sorts of tissue to originate pain; there are bones and interarticular cartilages, ligaments, muscles, tendons and aponeuroses. Three of these can be grouped as fibro-elastic tissue. There are also lumbo-sacral nerve radicles and the filum terminale of the cord; lesions of these approach our subject only when caused by pressure from a herniated disc. It is lesions of muscle and fibro-elastic tissue which afford most fertile ground for speculation. Detailed discussion of them requires, in preface, an appreciation of some of the peculiarities of the locale.

The human has assumed his orthograde pride at the expense of a handicapped lumbo-pelvic architecture; the primitive vertebral arch, fixed at its caudad end to the sacrum, has been bent sharply backward into a reverse curve which entails, numerically, its lower quarter. This is so rigidly fixed to, and aligned with, the upper surface of the sacrum that its curvature is determined by the pelvic angle, the degree of cant on the acetabular fulcrum. There is no compromise. In a standing posture the pelvis is well fixed, not only by the balance of the thigh muscle-groups, but by checks; the ilio-femoral ligament on each side and, of greater power, the fascia lata, which holds down the anterior arm preponderantly.

From this base the spine makes its movements. Its muscular mechanism is probably the most extraordinary of the whole body. It seems a miracle that the spine can be kept aligned at all. There are twenty-two sets of intervertebral joints acting as fulcra, as many fibrous discs with hydraulic centres to act as checks and shock-absorbers, and controlling their movements are practically all of the muscles of the trunk except those of the shoulder girdles.

Extensors and flexors are those which apply mainly to our discussion. The extensors comprise a pair of bulky columns placed dorsal to the transverse plane of the vertebral bodies but attached by innumerable fascicles both anterior and posterior to the plane of the joint fulcra. One must recall here that attachments to trans-

verse processes in the thoracic region are posterior to the intervertebral joints, in the cervical and lumbar regions they are anterior, just as they are in the plantigrades back to the dinosaurs. An impressive point about this muscle system is that its fixed origin of pull is at the lower end, from its strong sacral and posterior iliac attachment; therefore its extensor power is effected at the expense of a heavy downward pull, and this downward pull increases progressively as the lower spinal levels are reached.

The sacrospinales are to the spine somewhat as the bow-string to a bow, except that in addition one must picture strands from the string being tied every half inch to the bow itself, so that tightening the string tends to make the bow align to its tautness.

We have become habituated to thinking of these as "spinal muscles"; this is a little unfortunate since it tends to make us forget that they have nothing to do with a very important spinal movement, that of flexion. The spinal flexors lie down the ventral surface of the body; they are attached to the mastoid and subocciput above, the symphysis pubis below; a simple system spritted well out by the rib cage to afford good leverage; they are the sterno-cleido-mastoids and the recti abdominis, linked into one force by the sternum.

This digression all has a bearing on the lumbar problem. It is easy to see points of lowered competence in the orthograde structure here; not only has this part of the spine become burdened with the weight of all the upper body, and the added downward stress involved in balancing the trunk, but it is bent forward out of line of stress: it is a bent mast.

Our instincts or conditioned reflexes or whatever they may be are our guides in obtaining maximum efficiency of effort; training is only a refinement; the boy who throws a ball, or still more marvellously the fielder who places himself exactly where a high fly of unknown trajectory, speed and elevation is to land, is able to do it by an automatic sensorimotor calculation that not only has nothing to do with knowledge, but is far beyond knowledge.

In applying this axiom to the employment of the lumbar region, it is interesting to watch the way of a man making the most of his strength in lifting a heavy weight; he manœuvres to straighten the lordotic lumbar spine and enhance its stress-strength, to get the line of pull as nearly as possible parallel to the line of

vertebral stress, and finally to use muscles of the pelvic girdle and lower extremities for the main burden of his effort. In short, he tries to conserve his spinal musculature as much as possible. To straighten the lumbar lordosis he brings into action his sterno-mastoids and recti-abdominis, lifting the anterior arm of the pelvis. It may be said that the strength of a back depends largely on the rectus.

Now to the sources of lumbar pain. Commoner examples of developmental defects are occult spina bifida, incomplete ossification of the 5th lumbar neural arch and partial sacralization of the 5th lumbar vertebra. The first especially is common enough as an accidental finding; *per se* all are asymptomatic but they lower structural efficiency especially in lessening provision for ligamentous attachments at a place where ligaments are so heavily burdened physiologically that depletion can ill be afforded; one might say that they depress functional capacity in direct proportion to their extent, permitting traumatic effects with abnormally little justification. Pain appears only after such trauma.

It is intended here that "trauma" shall mean not only disruptive effects of violence, extrinsic or intrinsic, but also the effects of continued effort beyond capacity. This makes it include what is called strain, acute and chronic. Acute strain pertains to muscular or fibrous ligamentous structures; in more accessible regions we know that it involves avulsion or rupture of fibres, and bleeding. We know that ruptured muscle tissue in such muscles as the plantaris or biceps heals, leaving a painless cicatrix. On the other hand we know from examination of accessible sites such as the foot that evidence of strain—elongation and local tenderness—is found not over muscular tissues, but over ligamentous structures. More than that, the tenderness in affected peri-articular ligaments is on the side of the joint where stretching occurs, and forced stretching aggravates the pain.

From these analogies it seems reasonable to make certain deductions about strain in the lumbar region; that because it leads to protracted pain it is a lesion not of muscle but of ligaments, and those probably the ligaments which check lordosis since pressure ventrad increases the pain. What ligaments these may be is very speculative; they are too inaccessible to localize; it is difficult to estimate whether peri-articular or anterior longitudinal ligaments take the most strain. The localization of pain in

certain torsion tests would indicate that the lateral lumbo-sacral articulations, at any rate, are sometimes the site of strain. These same tests also indicate that the sacro-iliac joints, at least in the prearthritic years, are rarely the source of painful lesions. When interspinous ligaments are the site of pain and of tenderness acute trauma is usually the cause, and radiographic evidence may be present.

One type of chronic strain is worthy of separate identification; it is the cause of "postural back-ache" and is of psychic background with the asthenic posture as a physical expression. The trunk is allowed to slump habitually into the position of least effort, the abdominal wall is used unduly for respiratory excursion and its muscles are kept relaxed for this purpose; the slack rectus fails to hold up the pubic arm of the pelvis and lumbar lordosis, often betokened by a "sway back", is the result. A lowered threshold of capacity and undue tendency to lumbar strain is the outcome; this may be a source of pain from no more effort than walking, or still more from continued standing, and its diagnosis is apt to be overlooked because no localized tenderness is found in the back. Its distinction from other types of strain is important because while they are treated by rest this is amenable to treatment on opposite principles. Provided that the psyche is yet plastic, it entails correction of posture and of breathing habits, and retraining of the recti abdominis to properly elevate the pubic bones and lever back the lumbar spine into some semblance of straightness. For mechanical reasons such abdominal exercise should be given in the supine position.

The final traumatic lesion to be mentioned is the protuberant intervertebral disc; it again is presumably a penalty of upright posture and locale—maximum weight bearing, maximum shock-taking, maximum stress from down pull of sacrospinates. For several reasons it is really outside the rather speculative scope of this discussion.

The lumbar region suffers no more than others in most generalized inflammatory diseases, and there are none specific to it. One presumably inflammatory disease, however, is the most common of all causes of lumbar pain. It is most acceptedly called fibrositis, but its incomplete understanding is reflected in its multiplicity of synonyms; myalgia; myositis, neuritis, and, regionally, torticollis, brachialgia, intercostal

neuralgia, etc. In the lumbar region it is commonly called lumbago. Much more attention has been paid to it on the other side of the Atlantic than here. Its victims seldom attain hospital level and no doubt this is a factor in our lack of basic knowledge about it.

An English authority describes fibrositis as a "non-suppurative inflammatory process affecting white fibrous tissue. It may be relatively acute or more commonly chronic. It may be limited to small areas, single or multiple, or may affect a considerable area such as the aponeurosis of the back or scalp, or the panniculus adiposus. The morbid anatomy is an inflammatory hyperplasia of connective tissue usually in patches with local exudation of serum and proliferation of fibroblasts; the walls of the small arterioles become thickened and nerve fibres and muscle spindles may become involved in the exudate. The patches undergo resolution in favourable circumstances, but may persist and form local indurations or nodules varying in size from a grain of wheat to a bean, or may form strands causing adhesions between muscles, ligaments, and adjacent structures. Persistent nodules and indurations are liable to relapses and exacerbations, and thus enlarge to form large plaques which tend to contract like scar tissue."

This inflammatory process must be of low grade; it is not accompanied by a raised blood sedimentation rate; it is questionably associated with foci of infection in which alveolar abscesses and prostatitis share chief honours. Lumbar muscles are a common site and probably the majority of men have felt the disability at some age from adolescence on.

Fibrositis deserves more attention than we give it; while it may not be a lethal disease it is important as a waster of man power, and it is important enough to the patient to lead him to the chiropractor if the doctor won't do something adequate.

Symptoms and signs of lumbar fibrositis are usually clear cut; they depend on the presence of the characteristic nodules which if they are not of muscle are nevertheless within it, giving rise to irritability of muscular tissue and to tenderness.

Irritability leads to cramp-like contractions which are very painful, to a tendency in less acute stages toward chronic muscular spasm which causes pain during movement either of contraction or elongation; the combination provides the familiar picture of the back that hurts on change of position and that halts "frozen" in transient agony if movement is attempted in the acute stages.

This type of pain is the characteristic symptom, but the diagnosis is incomplete unless the

characteristic sign accompanies it, which is sharply localized tenderness on pressure over each fibrositic nodule. Muscular spasm is obvious to palpation over the affected muscle in acute stages and leads to scoliosis which is ipsilateral as distinguished from the contralateral scoliosis of intervertebral disc protrusion; spasm may be impalpable in the more chronic stage, but localized tenderness is not absent while there is pain. Its authenticity must be shown by marking the spot found tender under finger-tip pressure and checking it later by approach from a different direction; this is one's weapon against simulation. Fibrositic tender points are usually multiple, often widely disseminated. They are common in the trapezius at mid-shoulder and in the pectoralis major, locations which are far removed from bony and ligamentous structures. It is this analogy which justifies the assumption that in the lumbar region the tender lesions lie within muscle, not in underlying skeletal tissues.

Our present treatment of fibrositis consists in muscular relaxation by heat and rest in the acute stage, heat and directive massage in the chronic; and there seems little doubt that attainment of muscular fitness, whatever that is, increases the resistance of tissues to inroads of the disease.

An interesting type of painful back occasionally seen is one in which lumbar pain appears suddenly, as a rule during some posture of disadvantage, remains for hours or days and disappears as suddenly as it came. There is muscular splinting over such a lesion, but otherwise it does not resemble fibrositis. In certain textbooks the syndrome is ascribed to subluxation of an interneuronal joint between lumbar vertebrae, and the sudden relief to spontaneous or manipulative reduction of the subluxation.

Of degenerative diseases one would say little more than that they lead to no special lumbo-pelvic problems. Hypertrophic arthritis is common enough, in both intervertebral and sacro-iliac joints, but the extra wear and tear of the region does not seem to lead to much preponderance of symptoms. In fact, after the age of forty, x-ray signs of spinal and pelvic hypertrophic arthritis are as common without symptoms as with them.

Among the several causes of lumbar pain discussed, one would emphasize fibrositis and the various types of strain as lesions whose better understanding would yield important results.

TRAUMATIC PERFORATIONS OF TYMPANIC MEMBRANE DUE TO BLAST INJURY

By Lieut.-Col. P. E. Ireland, R.C.A.M.C.

Adviser in Oto-Laryngology

BLAST perforations of the tympanic membrane are usually a problem to the ear, nose and throat specialist in the army. Textbooks and previous civilian experience do not offer any suggestions as to treatment or disposal of this injury. This paper is based on 317 cases admitted to a Canadian base hospital in North Africa and Italy over the eighteen-month period from July 1, 1943 to December 31, 1944. The total number of man days lost in hospital was 7,038 and the average hospitalization per patient 22.5 days.

Blast perforation is caused by a severe strain on the membrana tympani by a sudden increase (or decrease) in pressure of the air column within the external canal, due to a nearby explosive force. In civil life, the only analogy is a ruptured drum due to sudden compression of this column produced by a slap on the ear.

From a combatant point of view, it is always interesting to note the type of weapon responsible for an injury. It was found that high explosive and mortar were the most common cause. This varied however as to whether the injury was during an attack or in static warfare. Rifles and other small arms have little influence. Blast from our own guns, to the gunners, has little chance of rupturing ear drums if proper precautions are taken for protection (0.6% of total cases). This has been also shown by observations on the ranges.

Several things surprise one in these cases, the chief being the progress of middle ear infection and mastoiditis. The picture differs greatly

TABLE I.
CAUSE OF BLAST

High explosive.....	220	(69.4%)
Mortar.....	31	(9.8%)
Land mine.....	30	(9.4%)
Aerial bomb.....	10	(3.1%)
Grenade.....	6	(1.9%)
Anti-tank.....	4	(1.3%)
Booby trap.....	4	(1.3%)
Bazooka.....	2	(0.6%)
Own artillery (gunner).....	2	(0.6%)
Blast (barrage balloon).....	1	(0.3%)
Torpedo blast.....	1	(0.3%)
Other causes.....	6	(1.9%)
Total.....	317 cases	

from that of acute otitis media where the rupture is from within, due to an inflammatory process from a virulent organism which extends by the eustachian tube from the nasopharynx. The infection following a blast injury is usually from the less pathogenic organisms directly from the canal itself and consequently runs a less violent course. A great number of the cases arrived with no evidence of middle ear infection (67.89%) and I think this percentage could be increased with accepted early treatment. The number of infected cases varies with the period of the year to some extent, and the prevalence of upper respiratory infections. In most cases temperatures are normal or not greatly elevated, pain is not marked, even with profuse discharge; early or primary mastoid tenderness is not present and deafness is not marked when the discharge is cleared away. In other words it is more the picture of a low grade infection similar to the recurrent attack found in a chronic perforation.

TABLE II.
EARS INJURED

Right.....	140 cases	(44.1%)
Left.....	118 cases	(37.0%)
Both.....	59 cases	(18.1%)
Total.....	317 cases	

TABLE III.
INFECTIONS ON ADMISSION

Dry perforations.....	215	(67.8%)
Perforation and discharge.....	102	(32.2%)
Total.....	317 cases	

Infection of the mastoid air cells was quite common and decision as to when to open the mastoid difficult. I was firmly convinced that outside of occasional exceptions, it was quite safe to defer mastoidectomy for from 6 to 8 weeks. It is quite possible to get dry ears, with normal hearing, even at this time. X-ray was of value only when repeated plates showed definite changes. There was not the destruction of cell outline and decalcification found in pyogenic mastoiditis of the acute streptococcus and pneumococcus groups. This was first noted by our radiologist, Major Taylor Adams, and we certainly felt that one could not rely on x-ray for positive or negative indications for opening of the mastoid. Simple mastoidectomies were done on eleven cases in this group. All of these were because of persistent discharge, pain (especially

at night) on the affected side, and evidence of persistent low grade infection as shown by occasional elevation of temperature, leucocytosis and sedimentation rate.

Treatment of blast perforation is largely that of common sense when the above considerations are kept in mind. At one time in the campaign, it was recommended by the British that sulfonamide powder be insufflated early into the ear. This was later discontinued as unsuitable and often harmful.

The correct treatment of recent rupture of a drum in the forward areas is important and the following are approved principles: (a) It is essential that no drops or no powder be instilled in the ear. No syringing should be done and no peroxide used. (b) If there is reason to suspect that the drum may be ruptured, but there is still some doubt because of blood or wax in the canal, leave the ear strictly alone. (c) The soldier should be warned to keep water out of his ear and avoid violent blowing of his nose. (d) A plug of sterile cotton should be placed in the canal and evacuation arranged to the nearest otologist.

Treatment by the otologist in this series of cases was careful removal of any blood clot from the canal without syringing. The location of the perforation and the acuity of hearing were recorded and, if the ear was dry (67.8% of cases), sterile wool was placed in the canal and observation carried out every second day. If the ear continued dry for a week to ten days, he was sent to Convalescent Depot with a note to return in three weeks' time for re-assessment. At this time, if hearing was satisfactory and perforation closed, he was sent to his reinforcement unit for duty. If however, a dry perforation persisted, he was re-boarded to H3 for base duties or line of communication, with a review requested after a 3-month period. Many were completely healed after the 3 months and fit for front line service.

The patient with discharge on arrival or developing it later was treated by acriflavine ear

TABLE IV.
CONDITION ON DISCHARGE

Perforation healed with satisfactory hearing (Cat. H1).....	174 (54.9%)
Perforation persisting but dry and quiescent.....	121 (38.1%)
Perforation persisting with active middle ear discharge.....	22 (7.0%)
Total.....	317 cases

drops and dry wiping t.i.d., followed, in the subsiding stages by alcohol and boracic drops. Penicillin solution in various strengths seemed to be of little value locally and this is due probably to the mixed bacterial flora, few of which are penicillin-sensitive. The sulfonamides are very similar in this respect and their use was limited to a few of the cases. Penicillin intramuscularly, when used in the severe types of infection, due to a penicillin-sensitive organism, was found very completely effective. The prime factor was the thorough cleansing of the residual pus in the canal and middle ear done at least once a day by the otologist himself. In a few cases with a large dry perforation, an attempt was made to stimulate closure by application of 10% silver nitrate to the margins and application of Cargill-membrane to the drum surface with collodion. Any success from this treatment was certainly questionable.

TABLE V.
DISPOSAL OF CASES ON DISCHARGE

To duty, category unchanged.....	205 (64.7%)
Recategorized to theatre base or L. of C. (Cat. H2 or H3).....	76 (24.0%)
Evacuated to U.K. on ear disability only	29 (9.1%)
Evacuated to U.K. because other wounds (ears not healed).....	7 (2.2%)
	317 cases

Of the 29 cases evacuated to U.K.—8 had a history suggestive of chronic otitis media and 7 were postoperative mastoids. The remainder had deafness with or without persistent or recurrent middle ear discharge. Some of these may require a radical mastoidectomy, but the 75-day limit in our theatre made this an impossible consideration in treatment.

TABLE VI.
COMPLICATIONS

	Cases
Simple mastoidectomies (1 bilateral; 7 evac. U.K.; 4 retained in base as H3).....	11
History previous otorrhoea with chronic or recurrent discharge.....	8
Nerve deafness, marked.....	7
G.S. wound mastoid with otorrhoea.....	3
G.S. wound mastoid with VII nerve paralysis.....	1
Purulent C.S. meningitis (recovered).....	1

Complications were few and are listed in the table above. The one case of proved meningitis came from a captured German hospital, and made a good recovery with intravenous sulfadiazine and intramuscular penicillin. His mastoid was not opened until two weeks later.

Hearing can be surprisingly good with even a large amount of the drum destroyed. Damage to the cochlea by blast was in evidence in seven cases. This was illustrated by severe nerve deafness with two cases having vestibular signs at the time of the injury, followed by complete loss of vestibular and acoustic function on the same side. Careful hearing tests were not possible with the equipment at our disposal, but there was ample evidence to show that many of the blast injuries showed mixed deafness of the middle ear and nerve type.

SUMMARY

1. A report of the treatment and disposal, in an active theatre of war, of 317 blast perforations of the tympanic membrane has been presented.

2. Early in the series, soldiers were sent back to front line duty if the perforation still persisted, but was dry and situated in the anterior quadrant. This practice was later discontinued because of the number of recurrent attacks of otitis media under front line conditions and the regimen described in the body of the paper was then followed.

My grateful thanks are due to Lieut.-Col. Mill, the British Adviser in Otolaryngology, for his help and also to the Nursing Sisters of No. 15 Canadian General Hospital, who faithfully kept the records from which these statistics were taken.

PERIPHERAL VASCULAR INJURIES

By Lieut.-Colonel F. W. Schroeder, R.C.A.M.C.

THIS report deals with 39 consecutive vascular injuries treated in hospital in N.W. Europe during a period of 8 months. It is concerned only with injuries of major vessels in extremities, and injuries which had received none other than first aid treatment at forward installations. Cases of vasospasm are not included. The series includes all cases admitted and no attempt at selection was made.

From the outset it was realized that prolonged retention of cases would be difficult in a forward hospital. In spite of this the patients were retained for a sufficient period of time to permit observation and reasonably accurate assessment prior to evacuation. The preoperative findings are fairly complete and recorded in the table. Where information is lacking such is indicated by a question mark.

Treatment was usually wide exposure of the lesion with removal of tension-producing clot and ligation of the wounded artery above and below the lesion. In three instances ligation was not employed and in a fourth instance operative treatment consisted of removal of a misplaced ligation. Further reference will be made to these. The accompanying vein was ligated only when wounded and not as a routine. Sympathetic block was used on two occasions as an experimental measure. Wide incision of fascia was done on three occasions for relief of tension in the calf. A purely elective incision was usually closed providing drainage was adequate at the site of original wounds. The post-operative care was considered to be most important. If fracture was present splinting was effective but minimal. The limb was exposed to room temperature and whenever possible kept dependent or at least level with the remainder of the body. Early movement of the hand or foot was encouraged. Patients were not evacuated until survival of the limb was assured. Where death of limb occurred amputation was done prior to evacuation. In two instances where brachial arteries had been ligated premature evacuation occurred through error. It is known that these limbs survived.

The results are classified in the table under four headings. Amputation of lower limb was necessary in five instances. Amputation of three fingers was necessary in one case of brachial ligation. In two cases a lower limb survived but motor and sensory disability persisted as a result of prolonged ischaemic trauma. In all the others complete survival of limb and function was assured at the time of evacuation insofar as could be determined. What the subsequent effects upon function might be as a result of impaired circulation cannot be stated here.

CASE 9

Repair of injured vessel in this man resulted in restoration and maintenance of continuity and survival of limb and function. However a rupture of the vessel at the site of repair occurred on the 9th day, necessitating ligation just below the profunda femoris artery. The latter at the time of second operation was seen to be greatly enlarged as compared to nine days previously. Pulse at ankle persisted following ligation and subsequent recovery was complete. Heparin was used.

CASE 12

This man had had a ligation accidentally placed about the common femoral artery and vein at a forward level with complete occlusion of both vessels. He was seen here 24 hours later and the limb appeared to be dying. Removal of the ligation resulted in restoration and maintenance of continuity of vessel and survival

of the limb. The damage to muscle as a result of prolonged ischaemia was however permanent in nature and disability will remain. Heparin was used.

CASE 18

A primary venous graft with Blakemore tubes was employed in this case with immediate re-establishment of continuity of the vessel. There was return of pulse at the ankle which persisted. Heparin was used. Recovery was complete. He was observed for 21 days following which he was evacuated. What the ultimate state of the grafted area will be remains to be seen.

CASE 20

Primary suture of lacerated vessel was done with re-establishment and maintenance of continuity without the use of heparin. Recovery after 12 days appeared complete in every way, and he was evacuated. What the ultimate result will be remains to be seen.

CONCLUSIONS

Certain definite conclusions have been drawn from this series, chiefly in regard to preopera-

Case number	Artery involved	Fracture associated			Gross sepsis	Shock preoperative	Distal circulation Absent, Poor, Fair, Good	State of muscle pre- operative. Normal, Dema, x, xx, xxx	Sensory loss preoperative	Delay—Injury to operation, hours	Ligation artery	Ligation vein	Venus graft	Suture artery	Sympathetic block	Incision fascia	Follow up days	Subsequent ligation days after injury	Results																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Lower third	Middle third	Upper third	Soft tissue loss severe	Soft tissue loss slight	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11	Case 12	Case 13	Case 14	Case 15	Case 16	Case 17	Case 18	Case 19	Case 20	Case 21	Case 22	Case 23	Case 24	Case 25	Case 26	Case 27	Case 28	Case 29	Case 30	Case 31	Case 32	Case 33	Case 34	Case 35	Case 36	Case 37	Case 38	Case 39	Case 40	Case 41	Case 42	Case 43	Case 44	Case 45	Case 46	Case 47	Case 48	Case 49	Case 50	Case 51	Case 52	Case 53	Case 54	Case 55	Case 56	Case 57	Case 58	Case 59	Case 60	Case 61	Case 62	Case 63	Case 64	Case 65	Case 66	Case 67	Case 68	Case 69	Case 70	Case 71	Case 72	Case 73	Case 74	Case 75	Case 76	Case 77	Case 78	Case 79	Case 80	Case 81	Case 82	Case 83	Case 84	Case 85	Case 86	Case 87	Case 88	Case 89	Case 90	Case 91	Case 92	Case 93	Case 94	Case 95	Case 96	Case 97	Case 98	Case 99	Case 100	Case 101	Case 102	Case 103	Case 104	Case 105	Case 106	Case 107	Case 108	Case 109	Case 110	Case 111	Case 112	Case 113	Case 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tive appreciation of the lesion presenting and the method of treatment.

1. Many of these men were admitted with an obvious lesion of a major vessel. The limb at the site of the lesion was tense but not too tense. The distal circulation was fair or reasonably good. There was no obvious persisting haemorrhage requiring immediate attention. Sometimes there was some question of a distal pulse. The vessel may have been partly torn, and, in spite of this and an overlying blood clot a moderate amount of blood was passing down the limb beyond the wound in the artery. With penicillin and sulfonamides available, sepsis was probably not a great factor. One might, under careful observation, postpone operation for a period of 12 to 24 hours and thus allow the collateral circulation to more adequately adapt itself to its increased load. Where persisting haemorrhage was a factor there was of course no alternative but immediate surgery.

2. Patients were admitted with an obvious lesion of a major vessel. The limb at the site of injury may or may not have been tense. Persisting haemorrhage was not a factor. There was no apparent circulation in the distal portion of the limb, collateral or otherwise. The limb was white and cold, often passively immobile, and muscles were already tense, firm and tender. Observations and questioning revealed the fact that this state of affairs occurred very early following injury—a matter of 2 to 3 hours. Obliteration of deep circulation alone did not seem responsible. Something had happened to the collateral circulation—call it spasm or what one will—which did not seem to recover in spite of any method of approach. The limb was doomed. There seemed to be some other factor involved—one which is not at all clear.

3. Repair of a wounded vessel can at times be done and continuity re-established and maintained with or without heparin. Collateral circulation can adapt itself quickly as a result of the diminution of the lumen and in a reasonable period of time, assume the entire load and permit ligation of the wounded vessel. The procedure is however a dangerous one and demands careful postoperative supervision and prolonged retention in hospital. Such is not always possible.

4. The use of tubes and grafts must be considered further, if for no other reason than to maintain circulation for a sufficient period to allow collateral circulation to take over the load.

Any method one might employ requires time and careful postoperative care. There are some cases ideally suited for and likely to benefit from this method of treatment. It can be employed even in time of battle in forward areas but with limitations and accompanying hazards.

5. The postoperative care would seem most important no matter what type of treatment had been used. Further immediate transport is definitely contraindicated. Only when distal circulation is well established should these patients be moved. Exposure of limb to room temperature is indicated. The application of heat to a limb hovering between life and death will soon tip the scales toward the latter. Splints where required must be effective but minimal. A position of dependency or one closely approaching the level of the body would seem desirable.

LOCALIZED (PRETIBIAL) MYXEDEMA ASSOCIATED WITH GRAVES' DISEASE*

By E. M. Watson, M.D.

*University of Western Ontario Medical School,
London, Ont.*

THROUGH common usage, the term myxœdema has become practically synonymous with hypothyroidism. Actually, myxœdema is a pathological condition involving the skin and other tissues, one cause of which is hypothyroidism. It is not generally known that the disorder can be associated with hyperthyroidism, particularly that of the exophthalmic goitre type.

Although the preceding literature described the occurrence of œdema complicating Graves' disease,^{1, 2} the earliest reference to the observed co-existence of myxœdema and Graves' disease which could be found was in a paper by Sollier,³ in 1891. Referring to the association of the two abnormalities, Putnam⁴ in 1894 admitted that myxœdema might co-exist with Graves' disease but he quite reasonably questioned the likelihood of the former condition developing while the thyroid was secreting an excess of its active principle.

Subsequent observations have established the fact that the type of myxœdema which is most

* From the Meek Memorial Laboratory, Department of Pathological Chemistry, Victoria Hospital.

commonly associated with Graves' disease is a localized condition affecting the lower extremities, and which may originate during the stage of active thyrotoxicosis. Apparently, the first published record of this variety of non-pitting edema was made by Hektoen⁵ in September, 1895, when he noted in the report of a post-mortem examination of a case of exophthalmic goitre that the skin over the anterior aspect of the lower third of each leg was swollen and elastic, like myxœdema. On section, the subcutaneous tissue appeared of a light yellow colour and infiltrated with a homogeneous, semi-solid mucoid material.

Watson-Williams⁶ described a similar case in December, 1895. Mackenzie,⁷ in 1897, recorded the occurrence of a non-pitting swelling resembling that of myxœdema, affecting the lower extremities, the feet excepted, of two patients with Graves' disease. Morrow⁸ reported an example of the disease in 1899 and, like Sollier,³ commented upon the symmetrical distribution of the lesions as well as their resemblance to elephantiasis. Dore,⁹ in 1900, also referred to a non-pitting swelling of the lower extremities, similar to myxœdema, in a patient with Graves' disease. Thereafter, interest in the disorder lapsed, evidently, to be revived in 1927 by Richter,¹⁰ although certain cases variously described during the intervening period as circumscribed scleroderma¹¹ and trophœdema,¹² involving the legs of patients with exophthalmic goitre, were doubtless examples of the same condition.

During the past 18 years a number of cases of localized (pretibial) myxœdema have been reported, mainly in the dermatological literature, which probably accounts for the failure of the disease to gain recognition in textbooks on medicine. Comprehensive reviews of the subject have been given by Pillsbury and Stokes,¹³ Carol¹⁴ and Trotter and Eden.¹⁵ The last-named writers were able to collect 45 published papers containing references to 73 recorded cases of localized pretibial myxœdema to which they added four cases.

Even although fewer than 80 cases of this particular type of atypical myxœdema are on record, the disease may be more common than is generally realized. In fact, Trotter and Eden¹⁵ found it in 3% of thyrotoxic patients when they looked especially for it.

Clinically, this peculiar form of solid œdema, which has been described as occurring only in

persons with present or past thyrotoxicosis, involves the lower portions of the legs, bilaterally, with extension at times to the dorsum of the feet or upward toward the knees. The lesions are variable, ranging from plaque-like nodules to diffuse irregular swellings involving the whole circumference of the leg. The affected areas of skin feel thick, coarse and dry to the touch and have an uneven contour. There is often an associated excessive growth of unusually coarse hair. The sites of the emergence of the hairs from the skin create a characteristic dimpled or "pigskin" effect. Pink or brownish discolouration may be present and the surface temperature of the affected parts may be several degrees cooler than that of the adjacent normal skin. In some cases, the skin is raised in irregular folds and any scars which may be present show hypertrophy. In many instances, the development of the circumscribed myxœdema has been preceded by pitting œdema of cardiac origin. According to the data reviewed by Trotter and Eden,¹⁵ about one-half the number of cases of pretibial myxœdema developed during the active stage of toxic thyroid disease, before treatment had been undertaken. In the remainder, the cutaneous lesions followed thyroidectomy but, in a considerable proportion of these cases, residual or recurrent thyrotoxicosis existed.

The characteristic histological features consist of the presence of so-called mucin or a mucin-like substance demonstrable by special staining techniques and an associated splitting apart of the connective tissue fibres. Hyperkeratosis is often present. There are no signs of inflammation or lymphatic stasis.

Knowledge regarding the biochemistry of the skin in health and disease is remarkably deficient. The bulk of the information concerning the nature of the changes in the skin in myxœdema has been acquired by histochemical methods. Apparently the only report of an attempt at the chemical analysis of the skin in this atypical myxœdema is that of Carol,¹⁴ who extracted a mucin-like substance which, after hydrolysis with hydrochloric acid, caused a slight reduction of Fehling's solution.

Opportunity has been provided to study two cases of this little understood type of myxœdema which is associated with Graves' disease. The observations are presented below.

CASE 1

Miss R.M., aged 19, with non-contributory family and past histories, became aware of fatigability, cardiac palpitation, tachycardia, nervousness and emotional instability in November, 1943. A soft, pitting œdema of both ankles, present only at the end of the day, existed for about one week and was followed by a persistent, irregular, solid swelling involving the lower third of the legs above the ankles.

Clinical investigation in February, 1944, revealed definite manifestations of thyrotoxicosis without obvious weight loss. The patient was apprehensive, tense and restless. The eyes had a distinct stare. The palms were moist and a fine tremor of the outstretched fingers was present. The thyroid gland showed moderate diffuse enlargement with a palpable nodule in the right lobe. The basal metabolic rate was +46%, with a resting pulse rate persistently faster than 100 beats per minute; weight 130 lb. There were no clinical signs of cardiac failure. The blood pressure was 140/60 mm. Hg.

Both legs between the ankles and the knees were definitely enlarged due to obvious thickening of the skin. The process was quite sharply demarcated below, forming a distinct ledge above the ankles; but it merged gradually into normal skin below the knees (Figs. 1 and 2). The involved parts had an irregular contour particularly noticeable on running the hand over the surface. The skin was quite dry in contrast to the moistness of other parts of the body surface. The elevated areas presented a pinkish, blotchy discolouration and there was a heavy growth of coarse dark hair over the anterior surface of the legs. The dimpling of the skin gave it an orange-peel appearance. This solid, non-pitting œdema involved the whole circumference of the legs which measured 16 inches at the calves and 12½ inches above the ankles. The skin temperature was 1 to 2 degrees lower than that of unaffected parts. The ankles and feet were normal in size and appearance. There was no sign of active inflammation and no similar lesions were present elsewhere on the body. A recently produced traumatic break in the skin surface on the anterior aspect of the right leg permitted the escape of a glairy fluid.

No albuminuria was present on repeated examinations. The non-protein nitrogen of the blood was 37.0 mgm. %. The blood sugar was normal. The total plasma proteins were 6.3%, consisting of albumin 3.6%, globulin 2.7% with an A:G ratio 1.3:1. A moderate hypochromic anaemia existed. With the exception of a slight relative lymphocytosis, the white blood cells were normal. The Wassermann reaction was negative.

A biopsy specimen of skin and subcutaneous tissue was obtained from an affected area with the patient under gas anaesthesia. During this operation, a layer of semi-solid, lobulated, yellowish material about one inch thick was observed between the epidermis and the fascia covering the muscle. A glairy, gelatinous substance oozed from the cut surfaces. A portion of the tissue so obtained was placed in absolute ethyl alcohol for histological study and the remainder was used for chemical analysis, as described below.

Histologically, the epidermis was essentially normal. The papillary and subpapillary layers of the corium showed hyaline degeneration of the fibrous connective tissue. The remainder of the corium in its entirety exhibited a wide separation of the connective tissue cells and the strands of connective tissue, by the presence of a homogeneous, finely reticulated substance in the interstitial spaces. Scattered foci of chronic inflammatory cells, lymphocytes and plasma cells, were observed about the small blood vessels, the sweat glands and the hair follicles (Figs. 3 and 4). The material in the interstitial spaces had the appearance and the staining characteristics of "mucoid".

When stained with haematoxylin and eosin, this took up the basophilic haematoxylin. With mucicarmine, it stained a bright to dark red colour and with thionin, it showed a metachromatic staining reaction varying from blue to purplish red.

This patient was treated with thiouracil with gratifying results insofar as the general thyrotoxic manifestations were concerned but without appreciable change in the condition of the legs.

CASE 2

Mrs. E.P., aged 55, developed symptoms due to thyrotoxicosis in 1938, including palpitation, tachycardia, loss of weight, exophthalmos, tremor and heat intolerance. Prior to a subtotal thyroidectomy in 1940, the basal metabolic rate was +60%. The thyroid tissue revealed epithelial hyperplasia typical of that occurring in Graves' disease. For about one year preceding the operation, ankle œdema had been noticed at night with its disappearance in the morning. While convalescing from the thyroidectomy, the patient became aware of the development of a different type of swelling which involved her legs. The skin became much firmer, coarser in texture and darker in colour than previously. The condition was not painful but an aching sensation would ensue if she were on her feet for any length of time.

Originally, this solid œdema was limited to the regions above the ankles, with an irregular distribution. Later, the feet became affected. The size of the extremities gradually increased and eventually assumed massive proportions which precluded her wearing shoes or moving about. Subsequently, deep furrows and ridges appeared on the feet and lower parts of the legs.

On examination, in March, 1945, apart from the extreme abnormality of the lower extremities noted above, the patient presented no remarkable physical or mental peculiarities, with the exception of obvious residual exophthalmos. There were, however, no manifestations of active hyperthyroidism or of hypothyroidism. The basal metabolic rate was +9%. Clinical and laboratory investigations failed to reveal evidence of cardiac or renal functional impairment. Hypochromic anaemia of moderate severity existed. The blood pressure was 154/86 mm. Hg.

The skin of the body, with the exception of the legs below the knees, was smooth and of fine texture, but from about eight inches below the knees downward the skin gradually became thick and hard; over the ankles, the dorsum of the feet and toes it was piled up in folds. The scars remaining from previous plastic operations showed hypertrophy and keloid formation (Figs. 5 and 6). No suggestion of such change was visible in the only other superficial scar which she had, namely, that resulting from the thyroidectomy. A growth of coarse black hair was present over the upper parts of the legs anteriorly.

In an attempt to provide the patient with some measure of relief from her physical disability, a series of modified Kondoleon operations had been performed. The material which was excised at these operations consisted of a grossly thickened epidermis, beneath which was a thick, heavy layer of greyish-white, tough, fibrous-like tissue from the cut surfaces of which exuded a slimy, stringy, gelatinous material.

Histologically, the surface of the epidermis showed marked hyperkeratosis, with atrophy and loss of the rete cones (Fig. 7). The papillary, subpapillary and deeper layers of the corium contained much mucoid substance which was laid down as a finely reticulated basophilic material in the interstitial spaces. Also, the deeper layers of the corium and subcutaneous tissue showed marked fibrosis, the appearance being that of dense hyalinized collagenous fibrous connective tissue, free from inflammatory cell infiltration (Fig. 8).



CHEMICAL DATA*

Considerable confusion has existed with regard to the terminology and classification in respect to mucins and mucoids. According to Meyer,¹⁶ mucin is a chemically meaningless term which should be used only to describe a slimy secretion. The mucins and mucoids belong to a class of substances called glyco-proteins, consisting of a combination of carbohydrate and protein. Meyer¹⁶ has undertaken a classification of these compounds, based upon the nature of the carbohydrate radicals which are, ap-

while Chain and Duthie²⁰ demonstrated hyaluronic acid, or a substance closely resembling it, in rabbit skin. A search in the literature for a description of the isolation of these mucopolysaccharides from human skin was unsuccessful, although Chain and Duthie,²⁰ without presenting any evidence, stated that there seemed to be an accumulation of hyaluronic acid in the skin of myxœdematous subjects. Trotter and Eden¹⁵ suggested that hyaluronic acid might be a constituent of the substance causing the swelling in localized pretibial myxœdema.

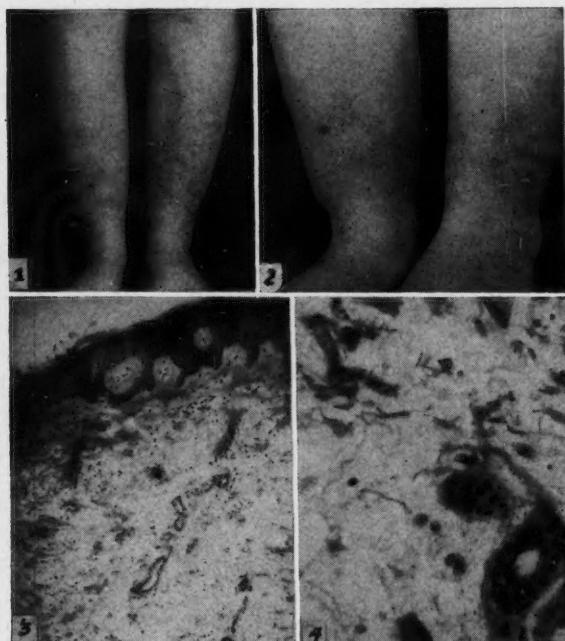
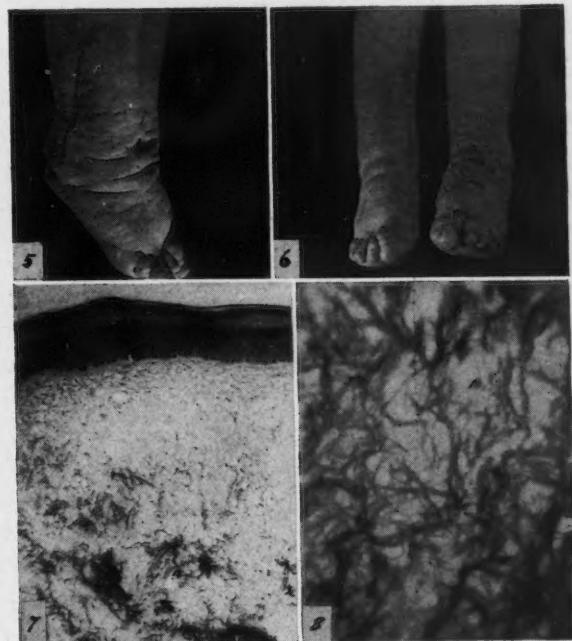


Fig. 1.—The clinical appearance of the lesions in Case 1, showing the general contour of the legs. **Fig. 2.**—The clinical appearance of the lesions in Case 1, showing the ledge-like demarcation above the ankles. **Fig. 3.**—Low-power photomicrograph of the skin biopsy from Case 1. **Fig. 4.**—High-power photomicrograph of the skin biopsy from Case 1.

parently, the essential components; and recent investigations have disclosed in a large measure the true nature of the substances. For example, Meyer and Palmer¹⁷ isolated from the gelatinous material in the vitreous humour of the eyes of cattle and from Wharton's jelly of umbilical cords a protein-free polysaccharide acid which they called hyaluronic acid. Meyer, Smyth and Dawson¹⁸ demonstrated a substance with identical properties in synovial fluid. Subsequently, Meyer and Chaffee¹⁹ separated hyaluronic acid and chondroitin sulphuric acid from pig skin,



Figs. 5 and 6.—The clinical appearance of the lesions in Case 2, showing their elephantiasis-like character. **Fig. 7.**—Low-power photomicrograph of the affected skin from Case 2. **Fig. 8.**—High-power photomicrograph of the affected skin from Case 2.

In an attempt to investigate the chemical nature of the mucinous material which was present in the specimens of skin removed from the legs of the two patients referred to in this report, the skin was treated in essentially the same manner as that employed by Meyer and Palmer¹⁷ for the isolation of polysaccharides from vitreous humour and umbilical cords. This technique was considered to yield the hyaluronic acid fraction. Treatment with alkali, according to the procedure used by Levene,^{21, 22} for the separation of the mucoid of scleræ, gave the chondroitin sulphuric acid fraction. For the purpose of comparison, samples of skin obtained from surgically amputated legs were analyzed in a like manner.

All of the samples, after treatment as above, were subjected to hydrolysis by means of a solu-

* The chemical analyses of the specimens of human skin referred to in this section of the paper were made by Dr. H. L. Williams, Senior Research Fellow in Pathological Chemistry and Mr. R. H. Pearce, Research Assistant.

tion of an active hyaluronidase preparation contained in an extract of bovine testes, made according to a method described by Madinaveitia.²³ This resulted in the liberation of reducing substances which consisted of hexosamine, estimated by the method of Palmer, Smyth and Meyer²⁴ and glucuronic acid, estimated according to the method of Maughan, Evelyn and Browne.²⁵ These two polysaccharides were found to be present in the hydrolysate in approximately equimolecular amounts.

It is of interest to note that of the substances capable of being hydrolyzed by hyaluronidase, only hyaluronic acid, chondroitin sulphuric acid and mucoitin sulphuric acid contain hexosamine and glucuronic acid in equimolecular ratios. Therefore, in view of the findings mentioned above, it must be assumed that mucopolysaccharides of this nature are constituents of human skin. The analyses revealed, moreover, that both hyaluronic acid and chondroitin sulphuric acid were present in much greater quantities in the affected skin of the patients with pretibial myxœdema than in the control samples of skin. The results of these investigations will appear in greater detail in a succeeding report.

DISCUSSION

The relationship of so-called pretibial myxœdema to thyroid dysfunction has not been explained. Doubt has been expressed as to the applicability of the word myxœdema in reference to the pathological condition in question. For example, O'Leary²⁶ preferred to avoid the expression "localized myxœdema" on the ground that the term myxœdema should be reserved for use in connection with the more classical clinical manifestations which develop as a result of the hypofunctioning of the thyroid gland. On the other hand, Pillsbury and Stokes¹³ favoured the descriptive term "circumscribed myxœdema", pointing out that myxœdema (mucin œdema) connotes but one feature of the myxœdematous process, while the word circumscribed serves to differentiate the particular disorder from conditions of general constitutional character.

That the pathological condition of the skin under discussion is myxomatous in nature seems certain. The presence of so-called mucin in the skin is a rather constant observation in myxœdema.²⁷ Carol¹⁴ demonstrated a mucin-like substance in the skin of a thyrotoxic patient with pretibial myxœdema, and Trotter and

Eden¹⁵ suggested that hyaluronic acid, a constituent of mucin, may be present in the affected skin of patients with this condition. The results of the chemical analyses referred to in the present paper lend support to that suggestion.

The existence of the mucopolysaccharide, hyaluronic acid, in excessive amount in the connective tissue of the cutis might be explainable in three ways: (1) its transportation to and deposition in the affected parts; (2) its formation in abnormal amount from connective tissue cells; or (3) as a result of a local disturbance of hyaluronic acid metabolism. The first possibility, *i.e.*, mucinous infiltration from without the affected sites, is extremely unlikely. Connective tissue cells possess the property of secreting a mucinous substance, but whether the accumulation of this material in excess, under certain circumstances, is a manifestation of cellular over-stimulation, degeneration, nutritional defect on a basis of gravitational œdema, a reversion to an embryonal state, or the result of an enzyme deficiency is undecided. However, it may be of significance in regard to the last-mentioned possibility that the enzyme hyaluronidase which causes hydrolysis of hyaluronic acid and reduces its viscosity has been demonstrated in rabbit skin in rather large amount.²⁸ The rôle, if any, of this enzyme in the pathogenesis of myxœdema is purely speculative at the present time. However, its possible significance in this regard is under investigation. Nevertheless, it is of interest to note that, according to the data of Meyer and Chaffee¹⁹ and Chain and Duthie,²⁰ hyaluronidase is identical with the "spreading factor" of Duran-Reynals²⁹ and McClean³⁰ which is of importance apparently in respect to the invasive properties of certain micro-organisms and possibly to capillary permeability as well.

The treatment of pretibial myxœdema is not encouraging. The condition has not responded to thyroid or other forms of medication. Excision of the affected areas, especially when localized, has been accomplished in some cases and the spontaneous disappearance of the lesions has been reported.

SUMMARY

Two examples of pretibial myxœdema associated with Graves' disease are described. In one case the myxœdema developed early in the course of the thyrotoxic disease, while in the other it followed a subtotal thyroidectomy in the absence

of obvious hypothyroidism. The clinical features of the condition, including its possible resemblance to elephantiasis due to lymphatic obstruction, are reviewed. In both instances, the affected skin showed a higher content of the mucopolysaccharides, hyaluronic acid and chondroitin sulphuric acid, than was found in the skin from the legs of other patients. The significance of these chemical substances in relation to the etiology of the cutaneous complications of thyroid disease is undecided.

The author wishes to express his appreciation to Dr. J. H. Fisher, Professor of Pathology, for the preparation and the interpretation of the histological specimens, and to Dr. H. O. Foucar for permission to include the record of the patient referred to as Case 2.

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THE CAUSE OF OLD AGE.—"As the World waxeth old, Men grow old with it: not by reason of the Age of the World, but because of the great Increase of living Creatures which infect the very air, that every way encompasseth us, and Through our Negligence in ordering our lives and that great Ignorance of the Properties which are in things conduceing to Health, which might help a disordered way of Living, and might supply the defect of due Government."—Roger Bacon: *The Cure of old Age and the Preservation of Youth*.

METASTATIC TUMOURS OF BRAIN*

By Mary I. Tom, B.A., M.B.

Toronto

THIS is a review of 82 cases of metastatic tumour in the brain. We have excluded the cases in which the metastases were confined to the skull or dura mater, and the cases in which the metastatic tumours were causing compression of the spinal cord or spinal nerve roots.

As would be expected, the majority of the tumours occurred in patients between the ages of 30 and 70, the sixth decade containing the largest number (Table I). About 60% of the tumours were in males.

TABLE I.

AGE INCIDENCE

Age	Male	Female	Total
1 - 9.....	0	0	0
10 - 19.....	1	0	1
20 - 29.....	2	0	2
30 - 39.....	4	7	11
40 - 49.....	10	8	18
50 - 59.....	18	11	29
60 - 69.....	9	5	14
70 - 79.....	2	0	2
Unknown.....	3	2	5
	49	33	82

The most common primary site, as shown in Table II, was the lung, and the large preponderance of males in this group is noteworthy. The breast came second in frequency as the site of the primary tumour. The primary in the breast was almost invariably recognized before symptoms of cerebral metastases were observed. This was not true of the primaries in lung. Metastases from large intestine and malignant melanomas formed the only other large groups.

Table III gives the cerebral sites of the metastatic deposits and the proportion of multiple to single metastases. It is interesting to note the numerous metastatic deposits in the pituitary gland and in the subarachnoid space. Only once in this whole series was a metastasis seen in the choroid plexus. The figure given in the table for single metastases is probably too high, as 18 of these 41 were operative cases which did not come to post mortem. In these cases we cannot be sure that additional cerebral metastases were not present.

* From the Division of Neuropathology, University of Toronto.

Read before the Section of Neurology and Psychiatry, Academy of Medicine, Toronto, January 19, 1945.

TABLE II.
SITE OF PRIMARY TUMOUR

	Male	Female	Total
Lung.....	11+4 (probable)	3	18
Breast.....	0	13	13
Large intestine:			
Rectum.....	1	4-5	
Colon.....	2	1-3	9
Cæcum.....	1	0-1	
Malignant melanoma	6 (1 adrenal)	1	7
Stomach.....	0	2	2
Thymus.....	2	0	2
Hypernephroma.....	2	0	2
Cervix.....	0	2	2
Pancreas.....	2	0	2
Prostate.....	1	0	1
Kidney.....	1	0	1
Nasopharynx.....	1	0	1
Bladder.....	1	0	1
Uterus.....	0	1	1
Ovary.....	0	1	1
Thyroid.....	0	1	1
Sarcoma: (Lympho., reticulum celled and retro-peritoneal).....	3	0	3
Undetermined.....	11	4	15
	49	33	82

TABLE III.
SITE OF METASTASES

Cerebral hemispheres.....	49
Cerebellum.....	23
Pituitary gland.....	19
Subarachnoid space.....	14
Pineal gland.....	5
Cranial nerves.....	4
Midbrain.....	1
Pons.....	1
Medulla.....	1
Choroid plexus.....	1
Multiple metastases.....	41
Single metastases.....	41
(23 of the 41 single metastases were in autopsy cases).	

In 49 of the cases included in these tables, the primary was recognized during life and a clinical diagnosis of metastatic brain tumour was made. In the remaining 33 cases, over 40% of the series analyzed in this paper, cerebral symptoms predominated and in some of these there was no clinical evidence of the primary growth. The following cases illustrate the latter of the two main groups.

CASE 1 (NP: 445-44)

On November 8, 1944, a male aged 70, was admitted to the Toronto General Hospital. For many years this man had had a chronic non-productive cough without haemoptysis. Early in the spring of 1944, he had an attack of pleurisy. In recent months he had shown a lack of interest. His memory and concentration were poor and he had slept a great deal. Recently he had noted shortness of breath. He was found sleeping on a dump and was admitted to hospital.

On admission, he was lethargic, confused and incontinent. His highest blood pressure was 120/60. The lower lobe of the left lung was dull on percussion.

He spoke slowly. His limbs were somewhat spastic, with hyperactive reflexes, but there was no paralysis or sensory loss. The fundi were normal.

He was considered to be suffering from cerebral arteriosclerosis but no more exact localizing neurological diagnosis was made. He died twelve days after admission to hospital, having developed signs of pulmonary oedema shortly before death.

At post mortem, a large bronchogenic carcinoma was found in the lower lobe of the left lung. Metastases were present in peribronchial and retroperitoneal lymph nodes, in liver, kidneys and diaphragm and on the outer surface of the pericardium.

His brain was heavy, weighing 1,490 grams. The cerebral vessels showed moderate arteriosclerosis. The right temporal lobe was larger than the left and softer on palpation, this softening appearing to involve the white matter rather than the cortex. On horizontal section (Fig. 1), senile cortical atrophy and

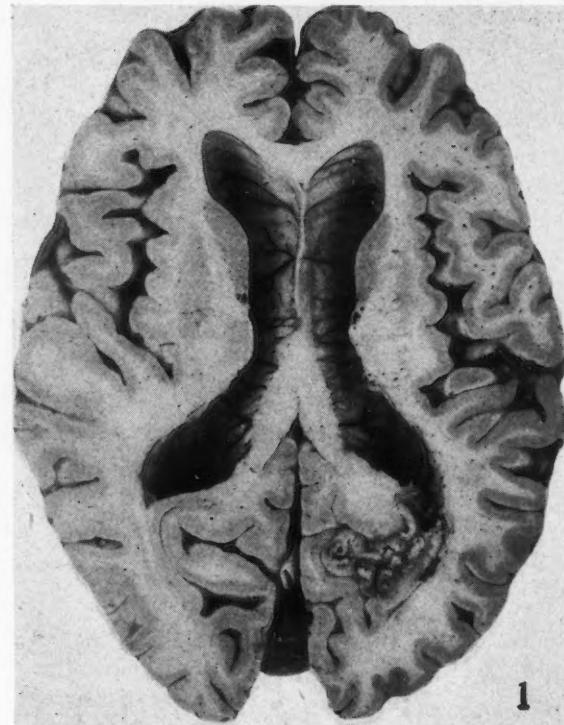


Fig. 1. (Case 1).—Tumour tissue can be seen in the left occipital lobe mesial to the posterior horn of the left lateral ventricle.

internal hydrocephalus of the lateral ventricles of a senile type were present. Greyish white friable tissue was seen in the left occipital lobe mesial to the posterior horn of the left lateral ventricle. The margin of this tissue was well demarcated. There was a break in the ependymal lining of the posterior horn through which this greyish tissue extended for a distance of 5 mm. into the cavity of the ventricle. A second large circumscribed mass was revealed on vertical section of the enlarged right temporal lobe (Fig. 2). This mass was extremely degenerated and cystic. Microscopical examination of these two areas confirmed the gross diagnosis of metastatic carcinoma.

CASE 2 (NP: 340-35)

A male, aged 54, was admitted to the Toronto General Hospital on October 21, 1935. He had shown progressive weakness of the right arm with Jacksonian seizures since February, 1935, a period of 9 months. Examination revealed a spastic paralysis of the right arm. There was early choking of the left optic disc and ventriculography showed the lateral ventricles to be

pushed to the right. A diagnosis of tumour in the left fronto-parietal region was made.

At operation, a firm dark tumour could be seen coming to the surface in the left Rolandic arm area. This lesion with the surrounding tissue was resected (Fig. 3). The tumour consisted of a round dark mass which was well demarcated from the surrounding tissue. Its gross appearance was strongly suggestive of a metastatic tumour. Microscopically the tumour had a fairly clearly defined margin but was not encapsulated. It consisted of irregularly arranged cells with rounded nuclei and rounded vacuolated cytoplasm. The central portion of the tumour was de-



Fig. 2. (Case 1).—A large cystic area in the right temporal lobe with an irregular necrotic wall in the subcortical white matter. The necrotic tissue, whose margin is well circumscribed, was found microscopically to be metastatic bronchogenic carcinoma.

generate and contained extensive old and recent haemorrhages.

On the gross and microscopical appearance of the operative material, metastatic tumour was diagnosed but no definite primary site was agreed upon. Autopsy, 7 months later, revealed the primary tumour—an atypical hypernephroma.

These two cases illustrate the fact that metastatic carcinoma in brain can produce marked cerebral symptoms before a primary lesion is suspected. In this group, lesions sufficiently large and localized to simulate a primary brain tumour, as illustrated by Case 2, are by far the most common. As a result, in reviewing our files, the greater number of these cases come from our neurosurgical material.

In our series of 82 cases of metastatic cerebral tumours there were 33 in which no primary neoplasm was suspected until operation or autopsy. The primary sites are listed in Table IV.

Eight cases were considered to have the primary tumour in the lung and in 4 of these the diagnosis was verified at autopsy. In 2 of the remaining 4, a neoplastic lesion in lung was found in postoperative x-ray films of the chest.

TABLE IV.
SITES OF UNSUSPECTED PRIMARY NEOPLASMS WITH CEREBRAL METASTASES

	Cases	Autopsy performed
Lung	8	4
Malignant melanoma	4	2 (1 adrenal)
Thymus	1	1
G. I. tract?	1	1 (head only)
Retroperitoneal sarcoma	1	1
Pancreas	1	1
Ovary?	1	0
Hypernephroma	1	1
Stomach	1	1
Unknown	14	4 (head only in 1)
	33	16



Fig. 3. (Case 2).—Tissue from the left precentral gyrus showing a well-defined haemorrhagic tumour in the subcortical white matter. The white central area of the tumour is degenerate and living hypernephroma tumour cells can only be found around the circumference of the tumour.

In a third, the preoperative diagnosis of a brain abscess secondary to a lung abscess, strongly suggested that the primary tumour was in the lung. In the last case, the patient had had his lung collapsed three years prior to the cerebral operation, for what was considered to be tuberculosis and silicosis.

In the 4 cases of malignant melanoma, autopsy revealed a primary in the adrenal in one case. In 2 no primary tumour was found, even though there was a complete autopsy in one of these. In the remaining case, a pigmented mole had been treated 2 years prior to the development of cerebral symptoms.

The patient whose brain tumour has been listed as probably arising from a primary in the gastro-intestinal tract had suffered, shortly before his cerebral symptoms developed, from what had been diagnosed as "abdominal influenza". A craniotomy was performed with the expectation that a brain abscess secondary to an abscess in the abdomen would be found. The autopsy was confined to examination of the head so the primary abdominal tumour was not seen.

Primary carcinomata in the thymus, pancreas and stomach and a retroperitoneal sarcoma were verified at autopsy.

The diagnosis of a malignant papilloma of the ovary was made solely on the histological appearance of the cerebral secondary.

The 14 cases in which the sites of the primary tumours are still unknown are interesting. Ten of these were operative cases in which clinically there were no preoperative signs or symptoms of a primary and of which we have received no subsequent history. In the remaining 4 cases, complete autopsies were performed in 3 but the head only was examined in the fourth. In one of the complete autopsies, widespread metastases were found throughout the body but no primary site was discovered. In the remaining two, no trace of tumour was found outside the cranial cavity.

In the whole series, 52 complete autopsies were performed. Primary carcinoma of lung was found in 14 cases, metastatic tumours in lung in 27 cases, and no involvement of lung in 11 cases; i.e., tumours were found in lung in 78.9% of all the cases of metastatic tumours in brain. Globus and Meltzer¹ in a review of 38 cases in which complete autopsies were done found this percentage to be 83, which corresponds very well with our figure.

Since there is this high incidence of involvement of the lung, x-ray examination of the chest should be helpful in differentiating between primary and secondary brain tumours. The three cases in this series in which a primary tumour was not found in spite of a complete autopsy emphasize the great difficulty which must be experienced clinically when the primary is small and silent.

CONCLUSIONS

1. A series of 82 cases of metastatic tumours in brain has been reviewed.
2. The most common sites of the primary tumours were lung (22%), breast (15%), large intestine (11%) and malignant melanoma (8%).
3. In 40% of these cases no primary neoplasm was suspected until operation or autopsy.
4. In 52 cases complete autopsies were performed. Of these, 78.9% disclosed either primary or metastatic tumours in lung. This high incidence of involvement of the lung emphasizes the value of a complete physical and x-ray examination of the chest in the clinical differentiation of primary from secondary tumours of brain.

I wish to thank Dr. William Boyd and Dr. Eric A. Linell for their valuable assistance in the preparation of the manuscript and Dr. Kenneth G. McKenzie for the opportunity of using his neurosurgical material.

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ECHINOCOCCAL CYST ARISING FROM THE PROSTATE*

By John A. Davies, M.D.

Windsor, Ont.

ECHINOCOCCUS cyst disease is rare in Canada. Records from seven of our largest hospitals over the past fifteen years show 37 cases:

Cisterna basali	1
Kidney	3
Liver	26
Mediastinum	1
Pelvis	1
Lung	3
Meninges	1
Abdominal wall	1

Winnipeg General Hospital reported 17 of these cases, 16 of whom came from Iceland: 14 in the liver, 2 in the lungs, 1 in the abdominal wall. Oldest 75, youngest 53. Doubtless cases are recorded throughout Canada, particularly in our Western Provinces, not included here. Involvement of the genito-urinary tract is not frequent. Dew placed the probable incidence in Australia at 2.3%. McGrath, 3% in 482 cases in the United States and Canada.

Hydatid disease has been recognized since the time of Hippocrates. In the English literature, the first report of pelvic hydatids was by Tyson in 1687. Plaggmeyer and Cummings, 1922, made a complete review of the literature up to that year and reported 71 cases of pelvic hydatid of which only 6 were in the prostate. Kimbell (1938) has collected 4 further cases and reported 2 of his own, making a total of 12. The Literary Research Department of the American College of Surgeons has recorded no further reported cases since that time.

The following account is taken from Boyd's *Surgical Pathology*:

"Hydatid cysts.—The cystic stage of many parasites is passed in the lower animals, but in man the only one of any importance is the

* Presented at Detroit Branch American Urological Society, June 6, 1945.

hydatid cyst. This is the larval or cystic stage of the *Taenia echinococcus*, a tapeworm which passes its adult life in the intestine of the dog. It is the smallest of all the tapeworms, measuring less than half an inch in length, and possessing only three segments. The head is well armed with two rows of hooklets and four suckers.

"The cycle of the tapeworm includes the carnivora and the herbivora. Starting in the intestine of the dog, the eggs are discharged in the faeces, contaminate drinking water and green vegetables and are ingested by man and such herbivora as sheep and cattle. In these animals the parasite passes through the cystic stage, but it can only return to the dog through that animal devouring the infected carcass or organs of an infected sheep or cow. The disease is confined to cattle-raising and sheep-raising countries, where the domestic relationship between men and their dogs is unusually close. It is prevalent in Australia and South America in particular, and used to be common in Iceland until preventive measures were instituted.

"The ripe segments, crowded with ova are discharged from the bowel of the dog, and ingested by one of the herbivora. The ova are surrounded by a capsule which becomes dissolved by the gastric juice, and the little embryos are set free. They are absorbed into the radicles of the portal vein, and are carried first to the liver. The liver, therefore, is the organ most commonly infected. If they pass the liver they will lodge in the lungs. Finally, if they pass the lungs they are carried into the systemic circulation and may settle in any organ of the body.

"The embryo now develops into a cyst and enters upon the larval stage of its career. The cyst wall is formed of two layers, each of which is characteristic. The outer layer or ectocyst is thick and resembles coagulated white of egg; it is made up of a number of parallel layers like the leaves of a book. The inner layer or endocyst is the germinal layer. From it are budded off new heads or scolices of the tenia. Each scolex develops in a little cup-shaped process known as the brood-capsule, there being many scolices in each capsule. One germinal layer may give rise to very many scolices. In addition to forming new heads, the endocyst may give rise to numerous daughter cysts, which usually develop within the main cyst, but sometimes outside of it. Within some of the daughter cysts

new scolices may arise. Others remain sterile. The irritation of the cyst leads to the development of a well marked fibrous capsule from the organ in which it is situated.

"The fluid in the cyst is clear and watery, non-albuminous, neutral and of a specific gravity of about 1.005. It often contains hooklets, and a precipitin reaction may be obtained when the fluid is mixed with the serum of a patient suffering from hydatid disease. In such a patient, a wheal is raised by the intradermic injection of hydatid fluid (Cesoni's reaction). The laminated membrane is quite as characteristic as the hooklets. The blood displays a slight degree of eosinophilia, which may be of some diagnostic value. It never becomes marked and is usually around 5%. It is important to remember that if the cyst suppurates the eosinophilia disappears.

"When the embryo dies the cyst ceases to enlarge, and secondary changes may occur. It may rupture externally, into a serous cavity or into a hollow viscous; suppuration may occur, with the formation of an abscess; or the cyst contents may become converted into a gelatinous mass and the wall becomes calcified. Leakage of the fluid may give rise to a rash resembling urticaria or scarlet fever, due to absorption of toxic products.

"The commonest site of a hydatid cyst is the liver, then comes the lungs, but it may occur in almost any part of the body, and the brain is by no means exempt. In the abdomen it is liable to be mistaken for other causes of enlargement, such as ovarian cyst, and I have known the abdomen to be opened in search of a carcinoma only to reveal a large hydatid cyst in the ileo-caecal region."

CASE REPORT

The case to be reported is that of a male, R.P., unmarried, aged 47. He was born on a farm in Yugoslavia and worked there for 32 years. Sheep and cattle were raised on the farm.

The family history was negative.

After coming to Canada, 15 years ago, he worked in a coal mine in Alberta, until coming to this locality, where he has been employed in a motor factory for the past three years. He had pneumonia in 1917; ventral hernia operation in 1941. No other illnesses or disability.

Patient was in good health up to nine months ago, when he began to complain of frequency of urination, with some difficulty and straining in starting the stream; frequency gradually increased until upon admission to hospital it had reached about every half hour by day and every hour by night. The amount voided was about two to two and a half ounces. No dribbling, no blood, or history of passing calculi. On a few occasions he had a dull pain in the suprapubic area.

Patient was well developed and well nourished. All systems apart from the genito-urinary, were essentially

negative. Blood pressure 145/78, pulse 80, regular, temperature 98.4°.

No costo-lumbar tenderness, no tenderness along ureters. Slight suprapubic tenderness. A smooth, regularly outlined, firm mass extended about two fingers' breadth above symphysis pubis. Genitalia normal.

No. 16 soft rubber catheter passed easily to bladder. Residual urine none. Bladder capacity 7 ounces. Digital examination of rectum revealed a smooth, firm tumour which appeared to extend from the lower border of the prostate upward beyond the reach of the examining finger.

The prostate could not be identified through the mass. The tumour extended to lateral pelvic walls and appeared cystic, slightly movable and was continuous with tumour in hypogastrum. The seminal vesicles could not be palpated.

The urine showed a trace of albumen and a few leucocytes; apart from the eosinophilia of 6% the blood elements were normal: non-protein nitrogen 32 mgm. %; creatinine 1.5 mgm. %; Wassermann test, negative.

Cystoscopy.—Instrument introduced with difficulty through vesical neck. The vesical neck presents an unusual picture. There is a marked encroachment of what may be prostatic tissue markedly irregular in outline, extending forward and involving right lateral wall to half distance to vault. What is normally the median lobe is also irregular. There appears to be little enlargement of left lateral lobe. What can be seen of bladder mucosa appears normal. Ureteral orifices not identified.

Cystogram.—X-ray examination shows a small bladder which has a very definite extra-vesical pressure defect, in the upper left quadrant. There is definitely some tumour mass posterior to the bladder pressing forward from behind and extends some 3 cm. past the mid-line to the right (Fig. 1).

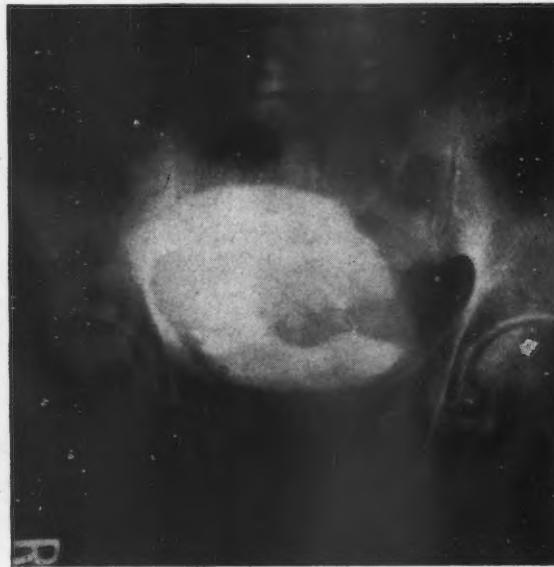


Fig. 1.—Cystogram antero-posterior.

A provisional diagnosis of Müllerian cyst was made and the patient transferred to the surgical service of Dr. F. R. Guest for operation March 6, 1945.

Operation.—Left paramedian incision below umbilicus. Large mass found extending from the lower part of the pelvis up as far as the pelvic brim, extra-peritoneal, extending up from behind the bladder and adherent to the rectum, and some loops of small bowel. It appeared pedunculated and was greyish in colour. The cyst was first separated from the rectum and small bowel and was found to extend below the reflection of the peritoneum in the pouch of Douglas. This was incised and the cyst separated from the levator muscles and from the posterior surface of the prostate with some difficulty. The seminal vesicles were ex-

posed in the dissection. An attempt was now made to separate the cyst from the posterior surface of the bladder, at which time the cyst ruptured and a large amount of watery fluid together with some daughter cysts were spilled; and the diagnosis of hydatid cyst was made. The daughter cysts were removed, avoiding spilling as much as possible. The part of the cyst which had been dissected out was removed, leaving a small piece attached to the posterior surface of the bladder. This was treated with full strength formalin solution, curetted well and again treated with formalin solution. A penrose drain was inserted and brought out through the lower end of the incision. The liver and gall bladder appeared normal and no other cysts were found. The appendix was found to be enveloped in adhesions and was removed. The wound was closed in layers with No. 10 chromic catgut for peritoneum and rectus sheath and wire No. 34 for skin.

Comment (F.R.G.)—This cyst appeared to have originated from the posterior surface of the prostate or from the posterior surface of the bladder as it was most densely adherent to these two structures.

Pathological report.—Large ruptured, cystic tumour 12 to 15 cm. in diameter showing marked thickening and calcification of the outer wall. The wall varies from 1 mm. to 1 cm. in thickness. There are numerous small cysts within the larger cyst, varying from less than 1 to 4 cm. in diameter. The wall is white and glistening and is laminated.

Microscopic.—Outer wall of the cyst consists of an outer layer of fibroblasts which is infiltrated with numerous lymphocytes and an inner layer of hyaline material. In one section there is a small nodule of prostatic tissue in the outer portion of the wall. The walls of the smaller cysts are composed of a hyaline-like material. No hooklets found.

Diagnosis.—Hydatid cyst arising from or attached to the prostate.

Recovery was uneventful. Discharged from hospital on 12th postoperative day. Wound healed, voiding freely, no frequency, urgency or dysuria.

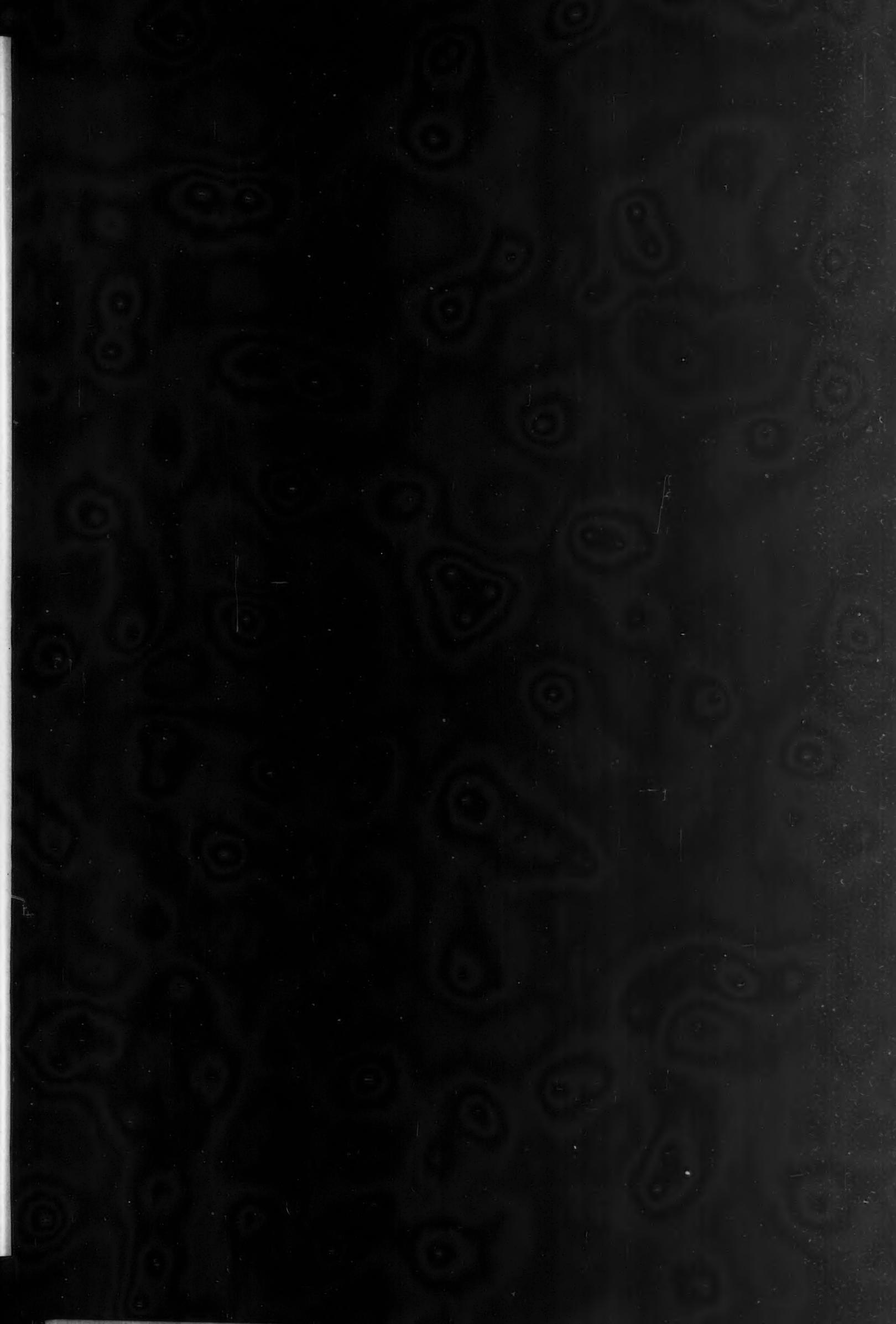
Digital examination five weeks after operation shows prostate normal in size, smooth in outline, not fixed, not tender with a marked depression in left lateral lobe.

Complications.—(1) Obstruction to urination. (2) Dilatation of ureters and renal pelvis. (3) Bowel obstruction. (4) Rupture of cyst intra- or extra-peritoneally.

Differential diagnosis.—Echinococcal cyst at this site must be differentiated from: (1) Müllerian cyst. (2) Retro-peritoneal sarcoma. (3) Abscess. (4) Bladder diverticulum.

Whether cysts of echinococcal origin are primary in the prostate is still an unsettled question. Marigold states: "The primary cysts of echinococcal origin in the prostate are questionable but several cases have been reported which are believed by their authors to be primary infections."

Liakhovitsky, in reviewing the Russian statistics finds the location of hydatid cysts in the prostate to be 0.2% and states: "The few cases published as such should be scanned with care because it is legitimate to suspect that in a number of cases the hydatid cyst was found not in the prostate but in the retrovesical region. Indeed in rereading the published histories, the author has reached the conclusion that in no



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case is there definite proof that the prostate was the primary location of the hydatid cyst." Plaggmeyer and Cummings in their exhaustive review, conclude "It is doubtful if hydatid cysts ever originate in the prostate".

SUMMARY

1. A case of hydatid cyst arising from the prostate is presented.

2. The symptoms were those of prostatic obstruction.

3. No reaction occurred following rupture of fluid into the peritoneal cavity.

4. The question of the origin of echinococcal cyst associated with the prostate is still unsettled.

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CASE REPORTS

INTUSSUSCEPTION IN THE NEW BORN*

By Fred W. Jeffrey, B.A., M.D., C.M.

Ottawa, Ont.

Intussusception occurring in the new born is exceedingly rare. So far as can be determined, there have been 17 cases recorded up to the present time. In reviews of the literature, Helmholz¹ referred to 3 cases, Hess² to 2, and Fitzwilliams³ to 2. Original reports have been made by Tweedy,⁴ Dowd,⁵ Steele,⁶ Perrin and Lindsay,⁷ Peterson,⁸ Gelston and Sappington,⁹ Mayo and Phillips,¹⁰ Schiavoni,¹¹ Lewis,¹² and Scott.¹³

Of the 17 cases, 7 were operated upon. Dowd's 5-day old infant with an irreducible intussusception requiring resection of one-third of the colon was the only one that survived.

In compiling the characteristic clinical findings, only 5 cases were found described in sufficient detail to be of value. These were recorded as follows: (1) Vomiting—present in all. (2) Blood-stained stools—present in all. (3) Absence of diarrhoea—noted in all. (4) Colicky

pain—present in one, not mentioned in 3, although one was described as irritable, and definitely absent in one. (5) Abdominal distension—present in 2, absent in one, and not mentioned in 2. (6) Palpable mass—present in 3, absent in one, and not mentioned in one.

To these reports, the following case, which appears to be the youngest on record, is added:

On August 26, 1944, at 8.20 p.m., a woman was delivered by Caesarean section, under ethyl chloride and ether anaesthesia, of a male infant at 8 months' gestation. The mother was a 31 year old primipara, who, after 42 hours of poor labour, showed definite evidence of primary uterine inertia. As the fetal heart sounds were becoming slower and fainter, surgical intervention was considered necessary.

The baby weighed 5 pounds 12 ounces at birth, cried vigorously and appeared in excellent condition. He was given synkamin and placed in the premature nursery. There were no unusual symptoms until 16 to 18 hours after birth. He had been taking small amounts of water without vomiting, but during the afternoon of August 27, the day after delivery, he had become restless, cried occasionally, and vomited for the first time at 6.00 p.m., 22 hours after delivery. He had passed no meconium since birth, although a considerable amount was observed in the amniotic fluid at operation. At 8.00 p.m., he had a small green mucoid blood-tinged stool, the first since birth. The vomiting continued, becoming bile-stained. On examination at 9.00 p.m., the infant appeared distressed. The abdomen was distended and on palpation, there seemed to be some generalized tenderness, but no mass could be felt. A rectal examination disclosed nothing unusual. A colonic irrigation yielded only a small amount of blood-tinged mucus, and failed to relieve the distension.

During the next 2 hours, the vomiting continued, and more bloody mucus was passed by rectum. Obviously the infant had intestinal obstruction, and a preoperative diagnosis of intussusception or volvulus was made.

At 12 midnight, 28 hours after delivery, a laparotomy through a midline incision revealed an intussusception of about 2½ inches in length at the ileo-caecal valve. This was reduced with very little difficulty and the abdomen was closed. The baby was returned to the nursery with a catheter inserted in the stomach, which was to be aspirated every hour. He was given synkamin and a continuous intravenous of 5% glucose in saline. The distension recurred the next morning and persisted despite heat, rectal tube, small saline enemas and stupes. All enemas returned clear, except the first, which contained a few minute blood clots. The temperature rose to 103 degrees, 14 hours after operation, but dropped to normal in 24 hours. The catheter was left in the stomach because bile-stained fluid was being aspirated. The infant gradually became weaker, despite blood transfusions, coramine and oxygen. The distension was slightly reduced, but the respirations became shallower and he ceased to breathe at 9.50 a.m., August 30, 58 hours after operation.

An autopsy performed 4½ hours after death was reported as follows:

Thorax and thoracic viscera.—These showed no changes of special note.

Abdomen and abdominal viscera.—The edges of the abdominal incision were firmly bound by a fibrinous exudate, while only a minimal amount of haemorrhage was noted in the surrounding area. A considerable amount of fibrin covered the serosal surface of the intestines binding the loops of these together by delicate adhesions. No purulent material was noted. The oesophagus was normal while the stomach was congested and filled with a large amount of gas as well as a small amount of bile stained mucus. Both the small and large bowels were considerably

* Read at the Seventy-sixth Annual Meeting of the Canadian Medical Association, Section of Paediatrics, Montreal, June 14, 1945.

distended throughout with gas and contained in addition a considerable amount of soft pinkish material, while the intestinal wall was thin and markedly congested. Areas of haemorrhage were noted throughout, but there was no evidence of any recurrence of the intussusception. The vessels of the mesentery were also considerably congested. The liver weighed 140 grams and was normal in its external configuration. The capsule was thin, transparent, smooth and glistening throughout. The parenchyma was of a yellowish brown colour and a small haemangioma, measuring about one cm. in diameter was noted near the anterior margin of the upper surface of the left lobe. The gall bladder was filled with clear mucus, while the biliary ducts were not remarkable. The spleen, pancreas and adrenals were essentially normal; the spleen weighing 5 gm., and the adrenals together weighing 6 gm. The kidneys together weighed 28 gm. and were covered with thin, smooth, glistening capsule which stripped with ease, revealing a firm reddish brown surface beneath, the fetal lobulations being well marked. The cut surface showed no disturbance of the cortical medullary ratio, but the pyramids were found to contain numerous fine bright yellow lines, converging towards their apices. The kidney pelvis, ureters and bladder were markedly distended with pale yellow urine containing numerous minute bright yellow specks resembling pollen in water. Microscopic examination of the urine showed it to contain large numbers of red cells, granular casts and epithelial cells.

Despite the gross appearance of the kidneys, little of note was to be seen on microscopic study. The glomeruli for the most part were of a small, rosette-like, compact, cellular structure similar to those usually seen in fetal specimens. The occasional glomerulus, however, was encountered in which a small amount of subcapsular fibrillar deposit was apparent, although no actual blood cells were encountered. The cytoplasm of the convoluted tubules was in many areas granular, fenestrated and disintegrating, while the nuclei stained poorly or were completely lost. Here and there collecting tubules were encountered, the lumina of which were slightly distended with pale, acidophilic, granular material, the nature of which could not be determined, though it showed little resemblance to albumen. No inflammatory changes were encountered in the kidney, the abnormalities which were present being of a purely degenerative nature, and probably toxic in origin.

COMMENT

The symptoms in this case were typical of intussusception at any age, with vomiting, blood-stained mucoid stools, and absence of diarrhoea. The infant undoubtedly experienced some abdominal discomfort as demonstrated by its restlessness, but there was no evidence of the colicky pain characteristic of intussusception in older infants. In surveying the previously reported cases which were described in detail, definite pain was recorded in only one case.

A preoperative diagnostic x-ray was considered unnecessary, as the signs of intestinal obstruction were so apparent.

The actual time of onset of the intussusception is difficult to establish. It is unlikely that it occurred until several hours after delivery, as the infant's behaviour was entirely normal for the first 16 to 18 hours. According to Ladd,¹⁴ blood appears in the stool probably 4

to 12 hours after onset. In this case, it was first noticed 24 hours after birth, which fact, when correlated with the symptoms, would suggest an onset at about 16 hours after delivery.

SUMMARY

So far as can be determined, 17 cases of intussusception in the new born have been recorded in the literature. The clinical findings of 5 are tabulated; the only cases described in detail. An additional case occurring during the first day of life is reported.

In preparing this paper, I wish to thank for their collaboration Dr. R. E. D. Cargill who conducted the delivery; Dr. H. B. Moffatt who reduced the intussusception, and Drs. M. O. Klotz and F. W. Hanley who performed the autopsy.

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BOECK'S SARCOID

By N. A. Ost, M.D.

Fort William, Ont.

Sarcoidosis is a comparatively rare and obscure chronic inflammatory skin condition. The literature on the subject in the journals and standard textbooks is very meagre. This paucity of information and the good therapeutic results obtained, have stimulated me to report the one case in my experience diagnosed as Besnier-Boeck's-Schaumann's disease.

The patient, Mr. J.D., aged 33, first came to me in November, 1941, with a chronic granulomatous nasal condition with marked telangiectasis and bulbous enlargement of the nose, the condition spreading laterally to both malar eminences. This had been present one year. It appeared at first to be a typical case of lupus erythematosus, and later as the patient's nose grew progressively larger, looked like rhinophyma.

The general physical examination was essentially negative. The concentration of haemoglobin was 15.3 gm., the flocculation test for syphilis was negative; the x-ray of the right ankle was negative and x-ray of the chest showed mid- and superior-mediastinal widening bilaterally, which was presumed to be on the basis of the sarcoidosis. X-ray of the hands and feet showed widening and irregularity of the shafts of the fourth and fifth metatarsals on the left; this, likewise, was presumed to be associated with the sarcoidosis.

The patient was given two courses of intravenous chrysotherapy (crisalbline) consisting of 500 mgm. each, without checking the spread of the condition.

Approximately one and a half years later it was decided to give the arsenicals a trial. Two injections of neoarsphenamine were given; following the second, the patient developed generalized purpura with fever, for which he was hospitalized. The reaction subsided after a week in hospital and at the time of dismissal the lesions of sarcoid were markedly improved.

Subsequently, owing to the patient's reaction to neoarsphenamine, this was replaced with weekly injections of mapharsen, combined with x-ray treatment to the face, the patient receiving 34 intravenous injections of 0.06 gm. of mapharsen and ten x-ray treatments to his face. The response to this therapy was only fair. There was some decrease in the size of the nose, but the purple flush still persisted over the nose, malar eminences and in the pre-parotid regions. There was an increase in the size of the nodular thickenings over the left malar eminence, with puffiness of the left eye, over both angles of the mandible, the metacarpophalangeal joint of the left thumb and in the interdigital webs of the fingers of both hands.

It was decided that the intravenous arsenicals (mapharsen) and x-ray to the face had been given a long enough trial. These were both discontinued and the patient took a course of three treatments of filtered x-ray therapy to the thorax as is done in some cases of lymphoblastoma, but no appreciable improvement was observed.

Finally, in desperation, the patient requested that another trial be given neoarsphenamine, with which improvement was previously observed, but had been complicated with the aforementioned reaction. A ready prepared solution (novarsan) was cautiously given intravenously, employing a dose of 0.45 gm. No untoward reaction was observed, however, and the improvement in the lesions of the sarcoid were noted even after the first dose. These were repeated at weekly intervals, and by August, 1945, the patient had received nine injections of neoarsphenamine. The nose resumed its normal shape and size, and the telangiectasis also cleared. The normal colour of the skin gradually returned and the subcutaneous nodular thickenings disappeared.

My patient is now very happy, but his physician is left in a quandary: he has discovered an effective remedy, but how long should he continue administering it and what is the criterion of a cure, or is there one?

The treatment of Boeck's sarcoid has usually been purely empirical and includes the use of arsenicals, tuberculin, iodides, gold salts, hyperpyrexia, ultra-violet irradiation, x-rays and radium. Chrysotherapy and x-ray in this case were ineffective, and the latest edition of Cecil's *Textbook of Medicine* states that roentgen and radium therapy offer nothing in this disease. Arsenotherapy, however, appeared to work satisfactorily, but apparently due to the molecular configuration, neoarsphenamine in this case produced results, whereas the mapharsen treatment was ineffective. Evaluation of any form of treatment is difficult because of the tendency of the lesions to spontaneous resolution.

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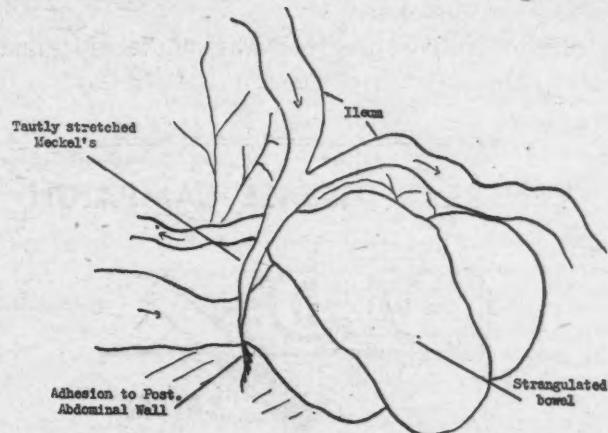
AN UNUSUAL CASE OF MECKEL'S DIVERTICULUM

By R. G. Large, M.B., F.A.C.S. and
J. J. Gibson, M.D., C.M.

Prince Rupert, B.C.

The writers report the following case as being of unusual occurrence:

R.B., an active male, 30 years of age, worked a full day at the shipyards and came home for supper. In the evening (September 7) he began to have intermittent crampy abdominal pain which became worse as the night progressed. During the evening, he vomited once with no relief from pain, and bowels moved once. We were first called the following morning, September 8, at about eleven. The patient



was in severe pain, located all across the abdomen but particularly on the left side.

On examination, he looked ill and was obviously in pain. The abdomen was very slightly distended. On palpation, there was general rigidity and tenderness with a point of maximum intensity just to the left of the umbilicus; pulse 80, and temperature 97°.

He was admitted to hospital immediately and a blood count was done; leucocytes 16,000; polymorphonuclears 89%; lymphocytes 10%; monocytes 1%. He was given a soap suds enema which returned with only a few particles of faeces. This was repeated using a double 1.2.3. enema with no results. He vomited twice during the afternoon and the blood count at 7 p.m. was, leucocytes 29,000; polymorphonuclears 83%; lymphocytes 15%; monocytes 2%.

A diagnosis of acute Meckel's diverticulitis was made and the patient's consent finally obtained for operation; 5% glucose in saline was given intravenously in preparation.

Operation.—A right lateral rectus incision was made in mid abdomen and the peritoneum

opened. Several coils of distended bowel presented which were easily recognized as strangulated. This seemed to be due to a tense band of adhesions attached to the posterior abdominal wall. When this was incised between clamps and disentangled from the gut, it was found to be attached to a Meckel's diverticulum which had been stretched to a marked degree. Being attached to the posterior abdominal wall it had formed a circle through which coils of ileum had become strangulated. In a few minutes, the diverticulum had contracted so that it was once more equal to the diameter of the adjacent ileum and about $1\frac{1}{2}$ inches in length. It was clamped and removed and the opening closed with Lembert sutures. The strangulated bowel had shown adequate signs of recovery so the abdomen was closed.

Postoperative progress was uneventful and the patient was discharged on the 8th day.

VENEREAL DISEASE CAMPAIGN



Examination of Cerebrospinal Fluid in Syphilis

EVERY CASE OF SYPHILIS MUST HAVE AN EXAMINATION OF THE CEREBROSPINAL FLUID

Cases of early syphilis, treated according to a schedule requiring six months or longer, should have a lumbar puncture at the conclusion of treatment.

Cases of early syphilis, treated with a rapid form of treatment, should have a lumbar puncture six to nine months from the time treatment was begun.

Cases of latent syphilis, or of late forms of syphilis, should have a lumbar puncture *immediately*, before beginning treatment.

CO-OPERATION OF PATIENT

A lumbar puncture is to be considered as a minor surgical intervention and, like all surgical interventions, should *not* be performed *without* the consent of the patient.

As a rule, by exercising a certain amount of tact, and by giving appropriate explanation to the patient, there is no difficulty in obtaining his consent.

When, in spite of all explanations given, the patient refuses to submit to a lumbar puncture the physician *cannot* consider himself as re-

leased of further responsibility in this regard. He should inform the patient that his treatment cannot be considered as complete unless the examination of the cerebrospinal fluid is negative, that the cerebrospinal fluid which has not been examined cannot be presumed to be negative, and that, therefore, further treatment will have to be given. At each subsequent treatment, the physician should try to gain the confidence of the patient. After a time, he may explain more fully to him the necessity for a cerebrospinal fluid examination. It is very rare that after a few weeks of such additional treatment and discussion of his problem the patient does not give his consent to a lumbar puncture.

Cases of Venereal Disease Infections Reported by the Provincial Health Departments to the Dominion Bureau of Statistics During the Year 1945

	Gonorrhœa	Syphilis	Ratio Gonorrhœa/ Syphilis
Prince Edward Island...	42	34	1.2
Nova Scotia.....	1,176	664	1.7
New Brunswick.....	1,079	413	2.6
Quebec.....	5,106	6,037	0.8
Ontario.....	8,224	4,930	1.6
Manitoba.....	2,336	622	3.7
Saskatchewan.....	1,685	410	4.1
Alberta.....	1,881	599	3.1
British Columbia.....	3,708	1,569	2.3
Canada.....	25,237	15,278	1.6

During 1945, 25,237 cases of gonorrhœa and 15,278 cases of syphilis were reported by provincial health departments to the Dominion Bureau of Statistics. This compares with 21,033 cases of gonorrhœa and 15,911 cases of syphilis reported in 1944. The ratio of gonorrhœa to total syphilis was 1.6 to 1 compared with a ratio of 1.3 to 1 for 1944.

The experience of the three Armed Forces in Canada from 1940 to 1945 reveals that the ratio of gonorrhœa to total syphilis in Canada for that period was approximately 6 to 1. It is apparent, therefore, that reporting of gonorrhœa by physicians in Canada is very inadequate. There is reason to suspect that syphilis is not being reported completely.

We know definitely that 15,278 cases of syphilis came to attention. Admitting that the ratio of gonorrhœa to syphilis was 6 to 1, it is estimated that in 1945 there were at least 90,000 cases of gonorrhœa in Canada. Of these, only 25,237 were reported by physicians.

There has been during the year 1945 a slight improvement over the preceding year in the reporting of gonorrhœa.

The above are preliminary figures and are subject to revision.

"Find V.D. Contacts—Report V.D. Cases"

SPECIAL ARTICLE

BRONCHIECTASIS

(A Review)

By E. P. Scarlett, M.B.

Calgary Associate Clinic, Calgary

The progress made during the last two decades in the understanding and treatment of bronchiectasis constitutes one of the most remarkable achievements of modern medicine. Probably because this development has been the result of work in the several specialized fields of thoracic surgery, bronchoscopy, radiology, anaesthesia and physiology, there is still an inadequate appreciation by the profession at large of this newer knowledge of bronchiectasis which has revolutionized the approach to the disease and provided rational and effective methods of treatment. The time has now come when bronchiectasis can be attacked intelligently, free from the confusion of ideas and the pessimism which formerly prevailed. There is no longer justification for ascribing chronic productive cough to "chronic bronchitis" or "asthmatic bronchitis" or "sinusitis" until the lungs have been studied by bronchoscopic and bronchographic means. And treatment which consists in the administration of cough syrup and advising a change of climate must be condemned.

Bronchiectasis (derived from the Greek word meaning 'bronchial dilatation') was originally described by René Laennec¹ in 1819 who reported clinical and pathological observations on four cases. The discovery of x-rays by Roentgen in 1895 gave a new dimension to the knowledge of thoracic disease, and the introduction of iodized oil by Sicard and Forestier² in 1922 provided an accurate method of diagnosis and laid the foundation for the intensive study of the disease which has followed.

It is now apparent that bronchiectasis is an irreversible, progressive disease with serious physical and psychological handicaps, which ends fatally in a large proportion of cases. It is more common than formerly believed. It is essentially a disease of youth and early adult life, and as such stands in close relation to the respiratory disorders of childhood. Add to these observations the fact that pulmonary lobectomy has solved the problem of treatment for approximately one-half of bronchiectasis patients³ and that non-surgical methods properly carried out may, in many instances, clear the pre-bronchiectatic state or alleviate the distressing features of the disease in most cases not suitable for surgical treatment, and the significance of the newer knowledge of this disease becomes apparent.

The purpose of this review is to present an integrated account of the more important studies which have been made in bronchiectasis, to call attention to the many new aspects of the etiology, the diagnosis, and the treatment of the disease, and particularly to emphasize the practical considerations which have emerged and which must now become part of the daily practice of medicine.

INCIDENCE

There is general agreement that, of the chronic pulmonary diseases, bronchiectasis ranks next in frequency to pulmonary tuberculosis. Hedblom⁴ and Ochsner⁵ claim that it exceeds tuberculosis. Earlier studies revealed a necropsy incidence of from 2 to 4%. An incidence of about 2.5% was reported by Willigk, Biermer, King and Lord⁶ in a series of 15,256 cases in which necropsy was performed. The actual incidence is difficult to determine because clinically bronchiectasis so often masquerades under the diagnosis of chronic bronchitis, pulmonary tuberculosis, asthma or lung abscess. Graham, Singer and Ballon⁷ and other writers have pointed out how frequently cases of bronchiectasis are considered to be tuberculosis. Ochsner⁵ reported an incidence of 92% of definite bronchial dilatation in university students in whom a diagnosis of chronic bronchitis had been made. The increasing accuracy of diagnosis will undoubtedly increase the number of cases in which the diagnosis is recognized clinically.

The age incidence of the disease has emerged slowly on account of the indefinite nature of the onset and development of symptoms. Hedblom⁴ reported that in a series of 134 cases in which the presence of bronchiectasis was proved by bronchographic examination, the diagnosis was made before the fifteenth year of age in 25.3% and symptoms began before that age in 43.2%. In 400 cases reported by Perry and King,⁸ the age incidence was as follows: under 10 years 42%, 11 to 20 years 27%, 21 to 40 years 24%, and over 40 years 7%. In other words, in 69% of their cases, the disease started in the first two decades of life. Recent literature indicates that as more informed studies proceed, bronchiectasis is being found more frequently among children. It may now be assumed that in a very large percentage of cases, the condition originates in childhood. This is an observation of the greatest significance.

ETIOLOGY

The cause of bronchiectasis has been much debated and the many theories put forward have served only to confuse the question. The problem was clarified by the complete discussion of Graham, Singer and Ballon⁷ in 1935 and since then a number of important publications have served to bring about a large

measure of agreement as to the major factors involved. These factors are bronchial obstruction, infection and atelectasis.

The correlation of the pathological and clinical facts with roentgenological and endoscopic evidence seems to demonstrate that in the larger group of bronchiectasis cases, the development of the disease is based upon atelectasis. The sequence of events would appear to be as follows: poor pulmonary ventilation caused by respiratory infections, notably bronchopneumonia; retention and stagnation of viscid secretions in the smaller bronchi; resulting bronchial stenosis; patchy or lobar atelectasis; highly negative intrathoracic pressure and pull of inspiration not absorbed by the rigid atelectatic part of lung and so transmitted to the bronchi which dilate; bronchial walls become infected because normal self-cleansing physiological factors are not operating; bronchial walls thus become weakened and dilate, and finally, with subsequent fibrous changes, the dilatation persists. This conception has been notably developed by Andrus⁹ in an admirable series of articles. It is supported by Graham and Singer,¹⁰ by Anspach¹¹ in studies of x-ray films, by Fleischner¹² and Hamman,¹³ and in a detailed study by Ogilvie¹⁴ of 68 cases observed over a period of years. Tannenberg and Pinner²⁹ as the result of animal experiments concluded that "the causation of bronchiectasis is inflammatory infiltration of bronchial walls with accumulation of exudate in the bronchial lumina; the latter is prevented from draining because of the artificially produced bronchial obstruction." The experimental work of Weinberg¹⁵ and of Lander and Davidson¹⁶ showed collapse to play an important part in the production of bronchiectasis. Furthermore Ellis,¹⁷ Richards¹⁸ and others have drawn attention to the fact that lobar collapse often occurs in the course of pneumonia in childhood. Holinger and De Bakey,¹⁹ as the result of bronchoscopic observation, have pointed out that commonly there is an inflammatory bronchial stenosis associated with respiratory infections, regarded in children as repeated "attacks of pneumonia", which in reality are due to atelectasis caused by retained and obstructing secretions.

Respiratory infections thus initiating the pathological sequence outlined above must be regarded as the most important cause of bronchiectasis.

Other conditions predispose to or cause chronic inflammatory changes in the bronchi. In such cases varying degrees of bronchial obstruction exist due to foreign body, carcinoma, fibrous stricture, enlarged lymph nodes, etc. Here there operate the same basic factors of bronchial obstruction, infection and atelec-

tasis, and the same chain of circumstances as detailed above supervenes.

The importance of the rôle of respiratory infection is borne out in the series of cases reported by Perry and King,⁸ in which the causes as given by their patients are shown in the following table.

TABLE I.

Etiology of bronchiectasis	Number of patients	% of group
Pneumonia.....	110	28.0
Acute respiratory infection.....	49	12.0
Following tonsillectomy and adenoidectomy.....	43	11.0
Whooping cough.....	35	9.0
Foreign body.....	18	4.5
Postoperative (other than tonsillectomy).....	16	4.0
Asthma.....	10	2.0
Contagious fevers.....	9	2.0
Pleural effusion.....	2	
War gas.....	1	0.5
Unknown.....	107	27.0
Total.....	400	

Warner²⁰ in an analysis of 104 cases found a similar situation. Perry and King⁸ consider it possible that collapse associated with one of these illnesses may lie dormant for years until a purulent bronchitis supervenes. And this view that bronchiectasis is due to superimposing an infectious element on a mechanical deformity is further borne out by the fact that so often the disease is maximal when it is first diagnosed.

The importance of obstruction to proper pulmonary drainage as a factor in the etiology is emphasized when one notes the normal lung architecture and then the lung involvement in bronchiectasis cases. All observers have noted that the left side is more commonly affected than the right. Duken and Van der Steinen²¹ suggest as the reason for this that (a) the right bronchus is a continuation of the trachea and is therefore more easily drained, (b) there is a constriction of the left bronchus where the left pulmonary artery crosses it, and (c) the left bronchus is narrower than the right and in children is easily compressed by the artery. This theory was substantiated by Perry and King's⁸ series of cases. In 167 children, 103 had predominantly left-sided and 32 predominantly right-sided lesions, while in 32 they were bilateral.

There are true congenital varieties of bronchiectasis, but they are rare, and for the most part are associated with other developmental anomalies, notably transposition of the viscera and dextrocardia (Adams and Churchill²²). Congenital cystic disease of the lung with secondary infection is probably more frequent than the non-cystic type of congenital bronchiectasis.

The relationship of sinusitis. — It was the prevalent belief for many years that chronic paranasal sinus infection was the common cause of bronchiectasis, and some writers still maintain this position.^{23, 24, 25} This conception, however, has been challenged by more recent studies. In a series of 552 cases, Hedblom⁴ found only 8 with evidence of sinusitis preceding the development of bronchiectasis. Riggins²⁶ reported the findings of sinusitis in only 30% of 100 cases of bronchiectasis, and two-thirds of these had evidence of bronchiectasis from several months to years before the onset of the chronic sinus disease. Goodale²⁷ in a study of 75 patients could not establish a cause-and-effect relationship between sinusitis and bronchiectasis, and regarded sinusitis as being an associated condition. All observers have noted that there are many patients with bronchiectasis who neither have nor have had sinusitis. In effect the majority opinion would now seem to favour the view that sinusitis is an associated condition in the bronchiectatic patient whose respiratory tract is in a state of lowered resistance. It is possible, too, as pointed out by Riggins,²⁶ that the nasal sinusitis may be secondary to the bronchiectasis. In this connection Perry and King⁸ concluded that "bronchiectasis and sinusitis remain two distinct conditions, the improvement of one being only contributory to the improvement of the other by way of improved general health and increased resistance."

Watson and Kibler²⁸ have suggested that most cases of bronchiectasis begin as an allergic bronchitis, and that in 90% of cases a definite diagnosis of allergy may be made. This conception of the etiology lacks support and convincing evidence.

PATHOGENESIS

The pathological features of bronchiectasis are of varying degree depending upon the chronicity and extent of involvement. The classical designations of cylindrical, fusiform, saccular and moniliform types are based upon the characteristic shapes assumed by the bronchial dilatations. The most common are the cylindrical and saccular dilatations or their combinations. Such terms have mainly a descriptive value. The dilatations may involve any portion of the bronchial tree and the extent of the involvement may vary from only a small localized part of a lobe to extensive bilateral involvement of several lobes. Lower lobe and particularly left lower lobe involvement is most common. In a clinical series of 113 cases by Hedblom,⁴ the left lower lobe was involved in 40.1%, and right lower in 27.4%, and both lower lobes in 28%. Necropsy cases which represent more advanced lesions show a higher incidence of bilateral involvement. Bronchiectasis limited to an upper lobe does

occur and is of importance because of the tendency to confuse it with tuberculosis and because of the different clinical picture which it presents, such cases tending to show haemorrhage rather than cough and expectoration.

Of particular importance is the frequency of involvement of the lingula division of the left upper lobe. This has been emphasized by Churchill and Belsey³⁰ who in an operative series of 55 left lower lobe bronchiectasis found the lingula involved in 44 or 80%.

The pathological process has been the subject of many studies,^{31, 32} and the nature of the changes is well established—in the early stage chronic inflammatory changes in the bronchial mucosa and submucosa, then progressive replacement of normal mucosa with chronically infected granulation tissue and replacement of elastic fibres and muscle bundles with fibrous tissue. Thus the first salient factor is proliferative and fibrotic in nature. This proceeds to contraction of a segment or of an entire lobe with ectasia of the bronchi. With progression of the fibrosis, emphysema may develop throughout the lungs. From the peri-bronchial tissue extension takes place into the parenchyma with suppuration, abscesses of varying degree and pleural adhesions.

Such an area is vulnerable to repeated infections, which explains the recurrent acute exacerbations in the course of bronchiectasis. Alexander³ stresses the association of such episodes which are recurring attacks of pneumonitis. Usually such pneumonitis occurs within the bronchiectatic lobe or lobes, but not always. The effect of such attacks is to increase the extent of the suppurative lesions of the parenchyma.

It is recognized that bronchiectasis once established in one or more lobes does not tend to extend to other lobes. Bronchopneumonia, however, may occur in a hitherto unaffected lobe and initiate a new area of bronchiectasis.

There are two important conclusions that may be drawn from this survey of the pathological characteristics of bronchiectasis, both of which have a most important bearing on the prognosis and the management of the disease. The first is the recognition that the process once established is irreversible. "No method of therapy will restore normal bronchial and parenchymatous structures which have been replaced by fibrous tissue" (Ochsner and De Bakey³³). And the second, that there is a pre-bronchiectatic state in which exists bronchial obstruction and atelectasis. The early recognition and cure of the atelectasis at this stage through the relief of bronchial obstruction by bronchoscopic aspiration of obstructive secretions or removal of foreign bodies will do much to prevent the development of bronchiectasis.

CLINICAL CONSIDERATIONS

It is now generally agreed that the insidious development of the disease begins in childhood. The onset dates from an attack of influenza, measles, pertussis or some other condition complicated by bronchopneumonia which may or may not be recognized. Then begins a cyclic disability which leads to a diagnosis of under-nourishment, anaemia, asthmatic bronchitis or chronic bronchitis. In other cases where recurring attacks of pneumonitis occur, a diagnosis is often made of pneumonia, or unresolved pneumonia without the basic pathological condition being suspected. The further course is that of a mild chronic invalidism slowly growing worse. Many such cases are diagnosed as tuberculosis.

It is important to realize that the disease, not unlike tuberculosis, is subject to remissions and relapses. At some time, and notably during remissions, the cases are potentially curable, and most observers are stressing that this opportune period not be overlooked, and above all that cases at such intervals be not regarded as "cured".

Symptoms show great variability in different cases and also in the same patient at different times. If dilatation of the bronchi is present before bronchial infection is added, there may be no symptoms except small or large haemoptyses. Such cases are called dry bronchiectasis. In Perry and King's⁸ series of 400 patients, 11 were of this type, their only symptom being haemoptysis or cough and haemoptysis. Roles and Todd³⁴ found that, of their 14 cases of dry bronchiectasis with haemoptysis as the only symptom, 10 developed symptoms of infection within six years and 3 died of their disease.

When, however, stagnant bronchitis is present, the classical symptoms are chronic cough and purulent sputum. These are frequently worse in the morning or may occur in paroxysms. Haemoptysis is common, and it is now felt that bronchiectasis is responsible for almost half of all instances of haemoptysis.³⁵ Haemorrhage occurred in 37% of the group of cases reported by Perry and King,⁸ and in 4 patients it was severe enough to cause death. Dyspnoea and cyanosis are usually late symptoms. Constitutional symptoms vary with the phase of the disease. The chief of these are intermittent fever, fatigue and loss of weight.

The general physical findings are variable, depending upon the extent of involvement and the duration of the disease. The findings in the chest are similarly variable, are not at all characteristic, and may commonly approximate the normal. Dullness may be elicited and probably the most consistent physical finding is the presence of moist râles at one or both bases before and after coughing. The physical findings have their chief value in localizing some pulmonary abnormality. Clubbing of the

fingers is common and may occur in as high as 57% of patients.¹⁴ In some cases clubbing is a sign of far advanced disease, but this is not an absolute conclusion.

A most interesting and careful study of bronchiectasis in children has been made by Raia.³⁶ The chief symptom was chronic cough; the outstanding roentgen-ray finding was persistent pulmonary infiltration and fibrosis; the left lower lobe was the most frequent site of the bronchiectasis. A preceding infection had occurred in all his cases, and he pleads for a closer recognition of early cases and in particular prophylactic treatment in giving adequate and prolonged care to attacks of pneumonia following measles or pertussis. He found that with adequate treatment a restoration to normal structure and function can take place in the early stages of the disease.

The most common complication of bronchiectasis is the recurrent attacks of pneumonitis. Other less common complications are brain abscess (this occurred in 8 of the 400 cases reported by Perry and King⁸), cor pulmonale, empyema and pyopneumothorax, and (least commonly) lung abscess and amyloid disease.

The significance of laboratory studies lies in the exclusion of the acid-fast organism and actinomycetes.

DIAGNOSIS

The most important point in connection with diagnosis is to keep the possibility of bronchiectasis in mind when examining patients who complain of chronic cough and expectoration. The disease is suggested by the history, the physical signs and in many cases by roentgenographic findings. It must be recognized, however, that bronchiectasis is one of the few pulmonary diseases which may be present to a serious degree without recognizable changes in the ordinary roentgenogram.

Every patient suspected of having bronchiectasis should have a bronchoscopic examination. Bronchoscopy alone gives accurate information about obstructing bronchial lesions such as carcinoma or foreign bodies or pyogenic granulation tissue. Aspiration associated with bronchoscopy prepares the bronchial passages for instillation of iodized oil. It is particularly valuable in patients who have intermittent bronchial obstruction manifested by chills, fever and respiratory symptoms.

The diagnosis of bronchiectasis can only be established by the use of contrast media bronchography, by which means it is possible to determine the distribution and extent of the disease. Various methods for the intratracheal introduction of iodized oil have been described. What is more important is that lung-mapping be carried out thoroughly. Alexander³ advocates the following routine procedure.

1. Lateral projection roentgenogram and postero-anterior roentgenogram to be taken before.
2. Bronchoscopy to gain information concerning obstructive lesions and to clear a passage for the iodized oil within 48 hours.
3. Iodized oil should not be introduced within three weeks following an attack of acute pneumonitis or any febrile pulmonary episode.
4. Iodized oil should be introduced in all five lobes to secure visualization. He uses the technique outlined by Adams and Davenport.
5. Take stereoscopic antero-posterior and oblique films when both sides are outlined.

In the assessment of a patient for surgical treatment, it is absolutely essential that a careful "mapping" of both lungs be done. It is important also to study carefully those cases showing bronchiectatic changes apparently too slight to require treatment by surgical means, and repeat the bronchographic examination at a later date if necessary.

Differential diagnosis is chiefly concerned with carcinoma, foreign body, and tuberculosis. Hinshaw and Schmidt³⁷ have emphasized the importance of distinguishing basal pulmonary lesions due to carcinoma which may closely simulate bronchiectasis. If such a lesion is unilateral, progressive and of recent origin and occurs in an older person, carcinoma should be considered and diagnostic bronchoscopy carried out. If such a group of circumstances occur in a child, foreign body is a possibility. Basal tuberculosis can occur and therefore it is important that sputum examination be carried out in every case of bronchiectasis.

The relationship of bronchiectasis to pneumonia which fails to resolve should be studied. It may be stated bluntly that "the term 'unresolved pneumonia' has no place in medical terminology. When post-pneumonic pulmonary infiltration persists, if bronchoscopic investigation is not carried out within a reasonable time, bronchiectasis may be the result."³⁸

The possibility of confusing bronchiectasis and primary atypical pneumonia is pointed out by Grier³⁹ who found that in a series of 40 patients with bronchiectasis, 67.5% had an initial wrong diagnosis of primary atypical pneumonia, and subsequently were found to have pneumonitis around a pre-existing bronchiectasis.

Roentgenological aspects. — Because x-ray is essential for the diagnosis of bronchiectasis and particularly for the early recognition of atelectasis which precedes bronchiectasis, the clinician should have some familiarity with features in the regular chest roentgenograms which suggest bronchiectasis, the x-ray signs in an early stage of the disease process before abnormal dilatations are present, and the bronchographic picture in established cases. These matters are now well established and are set out in any good textbook dealing with diseases of the chest. The reader may be referred to a valuable review by Pendergrass⁴⁰ of the

pulmonary dynamics and the roentgen appearance of pulmonary structures as they are related to the characteristic x-ray changes of bronchiectasis. In a review of this sort, attention should be drawn to the first two aspects of roentgen-ray diagnosis mentioned above.

With regard to the most important question of suspecting the possibility of bronchiectasis in the reading of the ordinary roentgenogram of the chest, Good⁴¹ states that from a study of routine chest plates, it has been possible to suggest bronchiectasis as a possible diagnosis in about 75% of the cases in which the condition is present. He states that bronchiectasis should be suspected: (a) Whenever there is x-ray evidence of a slowly resolving or recurrent bronchopneumonia in the base of one or both lungs. (b) Whenever atelectasis of a lobe or a portion of a lobe exists (particularly in children). (c) Whenever the pulmonary markings, particularly in the base of the lungs, are prominent or produce a honeycomb effect.

The index of suspicion is likely to be higher than that of ultimate confirmation, and of course the chest roentgenograms of a patient suffering from bronchiectasis may show no change from normal. Evans and Galinsky⁴² have also dealt with this question.

Having regard to the x-ray signs in the early stage of the disease, the presence of a basal triangular shadow is most important, and its significance has been thoroughly established by Anspach^{43, 44} who has shown that such a shadow is due to atelectasis which is the forerunner of bronchiectasis. If an established bronchiectasis is to be averted, treatment must be instituted at this stage before bronchial dilatation takes place. Thus the x-ray signs of atelectasis are of vital importance. In this particular the roentgenologist stands with the general practitioner and the paediatrician in the first line of defence against bronchiectasis.

PROGNOSIS

It is only within the last few years that the true prognostic picture of bronchiectasis has been clarified. It is now evident to a convincing degree that the prognosis of untreated or medically treated bronchiectasis is much more grave than generally has been believed. Follow-up studies indicate that bronchiectasis among children and adults is a progressive disease which, in a large proportion of cases, will end fatally.

Among the first to emphasize the serious nature of the disease were Findlay and Graham⁴⁵ who reported 9 deaths in a group of 12 patients observed for 12 years after onset of symptoms. They later reported that in 32 cases the average duration of life from the onset was 2.63 years. Roles and Todd³⁴ found a mortality rate of 38% in 106 cases in which the diagnosis was proved by bronchography and who were followed for a period of from three to six

years. They also found that of 49 cases treated medically for five years, 23 were dead, 9 totally incapacitated, and only four were "dry". Lebert⁴⁷ reported that in 52 necropsy cases in which death occurred as a result of bronchiectasis, 21% of the patients lived only a year after the onset of symptoms, 7.7% lived two years, 30.7% lived from three to five years, 15.5% lived from six to ten years, and 25% lived ten years.

The most comprehensive of the studies on prognosis is that of Perry and King.⁸ They reported on 400 cases admitted to the Massachusetts General Hospital from 1926 to 1938; 140 of these cases were treated surgically. Of the non-surgical group the mortality rate was 26%: 41% of these fatal cases died within five years after onset and 78% died as a direct result of bronchiectasis. Of the 144 living and traced patients who were not treated surgically, 123 continued to have cough and expectoration, and 33 had haemoptysis. In 96 persons in whom the disease developed before the tenth year, only 9.4% lived to or were living at age 40 or beyond.

Bradshaw, Putney and Clerf⁴⁸ reported 171 cases with non-surgically treated bronchiectasis admitted to the Jefferson Medical College Hospital with a mortality rate produced by the disease or its complications of 34.5% and with an average duration of life from onset of symptoms of 13.5 years. Riggins²⁶ in a series of 100 cases untreated or treated medically during a ten year period found that 14.1% died, 41.1% were worse, 46.6% unchanged, and only 13.3% could be regarded as improved. Laird⁴⁹ reported a series of 100 non-surgically treated patients in which it was found that 34 died of bronchopneumonia and 34 of general exhaustion.

Of nearly equal importance is the serious physical and psychological handicap which bronchiectasis imposes upon patients. In the group of patients reported by Riggins,²⁶ 25% were able to do full-time work, 40% part-time, and 35% were unable to work. Admission to hospital for respiratory infections was more frequent in this group than in patients with tuberculosis. Perry and King⁸ found that in 139 patients with non-surgically treated bronchiectasis, the working and living capacity was considered to be good in only 38%. In addition to the physical disability, there is a psychological handicap which affects the individual profoundly, not only in his mental outlook but in his social relations. This aspect has been particularly emphasized by Churchill.⁵⁰

The foregoing remarks on the prognosis of bronchiectasis may be underlined in the following statements. (1) The mortality rate in non-surgically treated cases is somewhere between 30 and 50% within a fifteen-year period after the onset of symptoms. (2) Patients in whom bronchiectasis develops before the age of ten

are unlikely to live beyond the age of forty. (3) The vast majority of patients with bronchiectasis will ultimately die of the disease or its complications. (4) The morbidity of the disease from both the physical and psychological standpoint is devastating.

TREATMENT—SURGICAL

In a review of bronchiectasis in 1936, the authors⁵¹ wrote:

"The indications for the various forms of treatment at the present time are not clearly defined. Bronchiectasis has always been a difficult condition to treat and the results have been generally poor. The renewed interest in this condition during the past few years will result in a better understanding of the possibilities of various forms of treatment but not until enough time has elapsed for a study of the end results over a long period".

It is a striking index of the progress made that we may now state a decade later that studies in prognosis have indicated that conservative treatment at best is ineffective. Mortality statistics prove conclusively that the surgical mortality rate in lobectomy and pneumonectomy offers a relatively small risk; *cure of bronchiectasis can be secured only by total extirpation of the damaged portion of the lung*; and there should be no hesitation in recommending operation. One may go further and state that, "a physician shoulders a grave responsibility when his advice withholds the benefits of surgery from a young patient suffering from the disease. Operation can no longer be termed a measure of last resort."⁵² There is still a general lack of appreciation of the achievements of thoracic surgery in this particular, and unfortunately in many quarters lung surgery is still regarded as heroic treatment.

The operative risk may be stated in summary fashion as follows: a mortality rate of 60% prior to 1923, with better selection of patients, and refinement in preoperative preparation, anaesthesia and operative technique, has been reduced to 3%. In 1935 Graham and his associates⁷ collected a series of 212 cases of bronchiectasis in which lobectomy has been attempted, with a mortality rate of 34%. Among the patients who survived operation the results were satisfactory in only 47%. In contrast with this are the recent reports which survey the results obtained through the combined use of bronchography, bronchoscopy, chemotherapy and improved operative technique. Edwards⁵² in 1939 reported 166 cases in which lobectomy was carried out with a mortality rate of 12%; only two deaths occurred in the last 54 cases. Graham,⁵³ O'Brien⁵⁴ and Lindskog⁵⁵ reported series of cases in which the mortality rates were about 5%. In a series of 124 cases of lobectomy Churchill⁵⁶ had a mortality of 2.4%. It may thus be stated that at the present time "the surgical mortality in cases of lobectomy for a reasonably well-local-

ized process in between 3 and 5%.⁵⁷ In unilateral or bilateral multilobar disease there is a somewhat higher mortality, although in total pneumonectomy "the risk of operation is no more than 10%, and probably less than 5%."

The aim in surgical treatment is early diagnosis and treatment. Lobectomy is the treatment of choice in those patients whose age, cardio-respiratory functional reserve and general condition are suitable. As stated by Edwards,⁵² any patient between the ages of four and forty years who has reasonably well-localized bronchiectasis with associated infection should be considered a candidate for radical resection, provided no serious contraindications exist. Children and young adults tolerate operation better than older persons, and in addition the disease is more localized in young persons. Furthermore, as shown by Bremer,⁵⁸ true hyperplasia of the remaining lung tissue will occur in the child to replace the removed lung in contrast with the compensatory emphysema which occurs in the adult. It is essential that by bronchographic "mapping" the extent and distribution of the disease be assessed before operation. The most favourable case is that in which the bronchiectasis is localized to one lobe or segment of a lobe. However total pneumonectomy for disease of an entire lung or bilateral disease are possible. Graham⁵⁹ reported a successful result in a patient requiring removal of the right lower and middle lobes and the left lower and lingula divisions of the upper lobe.

Successful surgical treatment depends upon the coordinated efforts of the bronchoscopist, roentgenologist, anæsthetist and thoracic surgeon. A word only concerning preoperative preparation. Generally speaking operation is better performed in the summer when epidemic respiratory infection is at a minimum. Operation should not be performed for ten days to two weeks after the use of iodized oil so that the lungs are free of this material. It is important that the disease be in a remission stage. Postural drainage should be instituted a few days before operation and in some cases bronchoscopic suction is advisable to clear the bronchi of an excessive amount of foul sputum. Transfusion of blood is indicated if the patient is anæmic. Chemotherapy is beneficial in reducing complications, and the use of penicillin inhalation in finely nebulized form in amounts of 20,000 to 50,000 units every three hours promises to be of value.

Refinements in anæsthesia have made possible the steady reduction of operative mortality in bronchiectasis, with the development of positive pressure anæsthesia which permits aspiration of secretion from the trachea at any time during operation. The reader is referred to detailed considerations of this subject in recent reviews.

No attempt will be made here to discuss the technique of the surgical procedure which is set forth in recent textbooks of surgery, and in recent periodical articles. Although variations in the details of operative technique exist, the salient features are now fairly well standardized. Wherever possible, individual isolation and ligation of the intrahilar structures is considered preferable. Bronchoscopy is carried out immediately following operation to clear the bronchial tree. The patient is placed in an oxygen tent for a variable period of time and is usually up within a week. Observers have been surprised how well patients tolerate the operation. Complications are unusual, the most common being suppurative pneumonitis which is largely responsible for the postoperative mortality. Other complications are empyema, secondary haemorrhage, suppurative pericarditis and cerebral abscess.

It is important that the lingula process of the left upper lobe be considered as a possible seat of bronchiectasis. In his series of lobectomy cases in 27 patients who had residual symptoms, Edwards⁵² found that 20 of these had bronchiectasis in the lingula division which had been overlooked.

Other methods of treatment which have nothing to recommend them are phrenicectomy, artificial pneumothorax, thoracoplasty operations, and roentgen-ray therapy as advocated by Berck⁶⁰ in 1934.

TREATMENT—MEDICAL

In the light of the foregoing remarks concerning surgical measures, the place of medical treatment in bronchiectasis becomes clear. Such treatment is essentially palliative and is of no curative value because the fundamental pathological process remains present. It is of use only in those cases in which the bronchiectasis is so extensive that it cannot be relieved by radical pulmonary surgery, or in those patients who refuse operation. In most instances medical treatment is unsatisfactory. At best it gives only symptomatic relief. Probably less than 10% of patients receive gratifying results.⁶¹ The principles of medical treatment consist of supportive measures, improvement of nutrition and drainage of the tracheobronchial tree. To be effective, medical measures must be carried out systematically and thoroughly. The chief of these is drainage with instruction to cough while in the inverted position. Heliotherapy is helpful. Clinical experience has shown that the drier climate of the southwestern part of the United States is beneficial to many patients.

The treatment of upper respiratory infection and sinusitis is relatively helpful. Instillation of sulfathiazole sodium solution has proved disappointing. It is still too early to express an opinion on the value of penicillin administered by nebulization. Periodic intratracheal

instillation of iodized oil has not been very successful and may do harm by locking up oil in the alveoli. Autogenous vaccine therapy has little to recommend it. The arsenicals may be of some use in the rare case in which Vincent's organisms predominate. Some authors, notably Thomas and Van Ordstrand,⁶² have reported improvement in the condition with the use of chemotherapy and allergy management. In 75 cases who for various reasons required to be treated non-surgically, Thomas and Van Ordstrand report significant improvement in a considerable percentage. The sulfonamide treatment consisted in 7.5 grains of sulfathiazole or sulfadiazine four times daily for a course of four weeks, such course being repeated periodically. The allergy management consisted in avoidance of the offending allergens, dietary restrictions, hypodermic desensitization with extracts containing the major exciting allergens and autogenous vaccines.

TREATMENT—PROPHYLACTIC

Since the primary pulmonary damage which eventually results in bronchiectasis usually occurs during pneumonic complications of the infectious diseases of childhood, children with recurring upper respiratory infections, bronchopneumonia, chronic bronchitis (so-called) and sinusitis should receive careful supervision and treatment. If the bronchopneumonia is atypical or protracted, the possibility of an atelectasis must be kept in mind and chest roentgenograms taken. If atelectasis is present and does not clear within a short time, bronchoscopic aspiration should be instituted. The early recognition of foreign bodies and their removal is imperative. Lung abscess and empyema require early and adequate drainage. In all these circumstances the bronchoscope plays a vital part, dilating bronchial stenoses, aspirating pulmonary suppuration, removing obstructing secretions from atelectatic areas and maintaining adequate bronchial drainage, all of which are essential in preventing the development of bronchiectasis.¹⁹ The primary responsibility for these preventive measures rests with the general practitioner and the paediatrician.

SUMMARY

The salient points which emerge from this survey of the recent literature on bronchiectasis may be indicated as follows.

1. The newer knowledge of bronchiectasis has revolutionized the whole conception of the disease and provided an effective basis of treatment.

2. Bronchiectasis is practically as frequent in occurrence as tuberculosis.

3. The disease in most cases has its origin in childhood.

4. The etiology of the disease is based upon infection, obstruction and atelectasis.

5. Bronchiectasis is a progressive disease which once established can be eradicated by no method of therapy except surgical extirpation of the involved area.

6. There is a pre-bronchiectatic state in which bronchial obstruction and atelectasis exist which can be relieved by bronchoscopic treatment.

7. Haemoptysis is a more common symptom than is generally supposed.

8. The term "unresolved pneumonia" should be dropped. Such a condition is commonly found to be due to postpneumonic bronchial obstruction and as such requires bronchoscopic treatment. Similarly, such diagnoses as "chronic bronchitis" and "broncho-sinusitis" should be closely scrutinized, as such conditions may in reality prove to be bronchiectasis.

9. The diagnosis of bronchiectasis can only be established by the use of contrast media bronchography.

10. The x-ray evidence of atelectasis should be more widely appreciated.

11. The prognosis of the disease is more serious than is generally realized. Patients who develop bronchiectasis before the age of ten are unlikely to live beyond the age of forty. Similarly the morbidity of the disease from both the physical and psychological aspect is very great.

12. Bronchiectasis can be cured by surgical means, and this fact justifies a more aggressive attack on the disease.

13. Most patients with bronchiectasis should be considered for surgical treatment. The diagnosis should be established as early as possible, as the best results are obtained among children and young adults.

14. Selection of patients for operation and operative treatment requires close co-operation between the bronchoscopist, the radiologist, the internist, the anesthetist and the surgeon.

15. Practically all patients with bronchiectasis are curable at some phase of the disease by lobectomy or pneumonectomy.

16. Medical treatment at best is palliative only.

17. Bronchiectasis may frequently be prevented by the proper supervision and treatment of pulmonary complications following infectious disease in children, of recurrent pulmonary infections and in all patients in whom pneumonia fails to clear satisfactorily. In such cases proper roentgenographic assessment and bronchoscopic treatment may be the means of preventing a later bronchiectasis.

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CLINICAL and LABORATORY NOTES

THE NUTRITION OF THE SURGICAL PATIENT*

By E. F. Bensley, M.D.

Montreal

For many years, measures have been taken in surgical cases to prevent water and salt deprivation and also to supply carbohydrates in the form of glucose. However, it is only comparatively recently that much attention has been paid to the provision of an adequate supply of all the known essential nutrients for surgical cases both preoperatively and postoperatively.

It is now recognized that: (1) malnutrition amongst surgical cases has been so common in the past as to constitute the rule rather than the exception; (2) this malnutrition has seriously delayed recovery in many cases and, in some instances, has even been a factor in causing postoperative deaths; and (3) this malnutrition can be corrected or prevented but its correction or prevention requires painstaking and detailed attention to the food intake of patients.

* Part of a symposium on Reconditioning of Surgical Patients, at the Montreal Medico-Chirurgical Society, January 18, 1946.

The best index of malnutrition amongst surgical cases, both preoperatively and post-operatively, is loss of weight due to tissue destruction. In general, loss of weight in these cases should be regarded as a sign of some degree of malnutrition. It should be borne in mind that such loss of weight is an earlier sign of malnutrition than are clinical evidences of vitamin deficiencies, anaemia or biochemical changes such as a fall in the serum protein or vitamin C level.

Similarly, maintenance or attainment of ideal weight and tissue mass is the best criterion of the adequacy of the food intake. Changes in weight and tissue mass are measured, when possible, by regular weighing of the patient. In the many cases in which this is impossible, fairly accurate judgment of the nutritional state can be made on the basis of other criteria, such as the general appearance of the patient, the tenseness of the skin over the underlying tissues, or the tightness of casts.

Malnutrition, as indicated primarily by weight loss, has a number of serious consequences. It can lead to postoperative weakness, delayed wound healing, wound disruption, nutritional oedema, anaemia, liver damage, impaired gastro-intestinal function, decubitus ulceration, lowering of resistance to infection and development of shock. These complications prolong the period of hospitalization, delay recovery with return to full activity and, in some instances, cause postoperative death.

The causes of malnutrition amongst surgical cases are many. Reduced to its simplest terms, malnutrition in these cases is due to a decreased food intake associated with an increased food requirement. Although this may appear to be an over-simplification of the problem, it has the advantage of emphasizing that most malnutrition in surgical cases is not so much a deficiency of one or two nutritional elements, but is rather general starvation. Indeed the picture presented by these cases is very similar to that which was encountered amongst recently liberated prisoners of war in the European theatre.

However, the correction or prevention of this malnutrition is not easy. Even in those cases in which food can be taken by mouth, adequate feeding is often handicapped by marked loss of appetite and also by a mistaken belief, held by most patients, that because he is in bed he does not need much food. The appetite is a rather unreliable index of nutritional needs and it becomes wholly undependable in ill or injured individuals. Indeed malnutrition in itself can cause loss of appetite and a vicious circle is thus set up.

Only the most careful attention to the feeding of the patient by doctors, nurses and dietitians will ensure an adequate intake of

food, and the intake must not be guided by the wishes of the patient. In other instances, the patient cannot take food by mouth and recourse must be had to tube or parenteral feeding. Fortunately it is now possible to maintain adequate nutrition by means of glucose, protein hydrolysates, salts and vitamins given either by tube or parenterally.

It must be borne in mind that not only is the food intake likely to be low, but also food requirements are likely to be high. In ill or injured patients (and an operation constitutes an injury in itself) there is an increased energy expenditure and an increased breakdown of body protein. In many cases there are additional losses from other causes such as bleeding or formation of exudates and discharges of one type or another. The ill or injured individual at rest in bed may be likened to a motor car standing still with its engine racing.

Perhaps the greatest obstacle to the attainment of adequate nutrition of surgical patients is failure to appreciate the amazing discrepancies which usually exist between the food which the patient eats and that which the surgeon thinks the patient eats. I refer to "surgeons" and "surgical patients" because they are relevant to the subject of this discussion. However, what I have to say in this connection applies equally to physicians and medical patients.

During the past three years, the Royal Canadian Army Medical Corps, both at home and abroad, has taken keen interest in the food intake of hospital patients. Individual food intakes have been measured in a number of Canadian Army hospitals and examples taken from the data obtained will illustrate my point. In one survey at an army hospital in Canada, it was found that the ration allowance per patient provided 4,135 calories and 156 gm. of protein per day; the amount actually consumed by patients was on the average 1,856 calories and 54 gm. of protein per day.* To quote another example, in the course of a similar survey overseas, we encountered a patient for whom the medical officer had ordered a high protein low fat diet; all concerned were satisfied that he was receiving it. Measurement of his actual food intake over a three-day period showed that he was in fact eating 67 gm. of protein and about 90 gm. of fat a day.

Finally, to cite another type survey, estimations were made of the vitamin C content of meals actually served to patients in army hospitals overseas. Even allowing for losses in cooking, it was thought that the patients should be receiving at least 50 mgm. vitamin C

* Stevenson, J. A. F., Sutherland, H. A., Taylor, G. G. and Kark, R.: Inadequate protein and caloric intakes of patients in military hospitals: a study of contributory factors, *J. Canad. Med. Serv.*, 2: 375, 1945.

per day. The average amount of vitamin C in the meals for the four hospitals was found to be 25 mgm. per day and, in one hospital, the amount was 9 mgm. only. The discrepancy between what the doctor thinks his patients eat and what the patients actually do eat must be measured and seen to be believed.

I think it will be obvious from these few remarks that the provision of adequate nutritional care of surgical patients can be achieved only by painstaking and detailed attention to their actual food intake.

ROUTINE RH TESTING BY A SIMPLIFIED CONGLOUTINATION TECHNIQUE*

By Herbert H. Lubinski, M.D.

Montreal

The discovery of blocking antibodies by Wiener¹ and the technique of conglutination subsequently developed by him² while conducting experiments on the slide test of Diamond and Abelson³ have substantially widened the serology of the Rh factor. The blocking test has a restricted value for practical purposes inasmuch as it can be used only for testing unknown sera for the presence of specific antibodies. The blocking antibodies have been used, furthermore, by Wiener⁴ to convert anti-Rh⁺ and anti-Rh⁰ sera into anti-Rh' and anti-Rh'' reagents. The conglutination technique, as originally described, is too complicated and time-consuming to be useful as a routine test for Rh factor, since the red cells of each specimen have to be washed and resuspended in either serum, plasma, or albumin solution.^{2, 7}

Based on observations made during a study of the nature of blocking antibodies and conglutinins a simple and material-saving technique has been developed which makes possible the use of blocking sera for routine Rh tests.

Red cell suspensions and dilutions of the blocking serum are made in the same way as usual for anti-Rh agglutination with saline. Two drops of serum and two drops of red cell suspension are mixed in small test tubes, incubated for half an hour and centrifugalized for two minutes at a speed of 1,000 r.p.m. The supernatant fluid is then withdrawn with a capillary pipette as completely as possible and replaced with two drops of normal group AB serum or any other serum or plasma compatible with the red cells which are to be tested. (It may be mentioned that cord serum cannot be used as replacing fluid, since it has been found by the author⁵ to be ineffective in the conglutination reaction, in accordance with Wiener's concept^{2, 6} of the pathogenesis of

congenital haemolytic disease.) The tubes are shaken well until the red cells are suspended completely. After another incubation for 15 to 30 minutes and a subsequent centrifugalization for one minute, the results can be read in the usual way. The tubes may be kept afterwards at room temperatures and read again later; the reaction becomes stronger with the passage of time.

About 75 different Rh-positive and Rh-negative red cell suspensions have thus far been tested, using six different blocking sera. In no instance has a difference been found to exist between the ordinary technique with anti-Rh agglutinating serum and the above described method. No difficulty has been encountered with rouleaux formation.*

If crystallized albumin as recommended by Diamond and Denton⁷ is available, a still simpler technique can be used:

Two drops of red cell suspension in saline as used for the ordinary blood grouping are centrifuged for two minutes at low speed, the supernatant fluid is removed and replaced with two drops of blocking serum (undiluted or diluted with albumin solution) and two drops of 25% crystallized albumin solution. After half an hour incubation and centrifugalization for 2 minutes the results can be read. The strength of the reaction increases during the next hours upon standing at room temperatures.

Although the number of cases tested by the two methods is still small, it was felt that because of the existing shortages of agglutinating anti-Rh sera these methods should be published at once.

I am indebted to Dr. A. S. Wiener (New York) and Mr. G. J. Van Dorsser for blocking sera and to Dr. R. L. Denton for albumin solution.

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* Wiener (personal communication) has been using almost an identical technique for some time.

Nothing so effectively baffles the schemes of evil men so much as the calm composure of great souls.—Mirabeau.

* From the Pathological Laboratories of the Jewish General Hospital, Montreal, Quebec.

THE CANADIAN MEDICAL ASSOCIATION**Editorial Offices—3640 University Street, Montreal***(Information regarding contributions and advertising will be found on the second page following the reading material.)***EDITORIAL****THE CANADIAN CANCER SOCIETY**

Eight years ago this month the Canadian Society for the Control of Cancer obtained its charter. The name was somewhat cumbersome. In conversation it was generally called the Canadian Cancer Society and recently this designation has been adopted officially. Next month (April) the Society will conduct a national campaign for funds and it is intended that a similar appeal will be made annually. The time coincides with the American Cancer Society's campaign.

It is fitting to recall here that the Society owes its existence to the Canadian Medical Association. The latter did the planning and set up the organization. Of necessity the beginning of the Society was modest. For the operation of a national body there was little money available. The first secretary, Dr. C. C. Ross, called at the outset for an annual budget of \$25,000.00, but less than half of that amount could be found the first year. However, the Society has carried on successfully and since the close of the war its activities have been greatly expanded.

The experience gained by the Canadian Cancer Society in the last eight years shows clearly that the fight against cancer cannot be waged successfully without the annual expenditure of a large amount of money. The charter of the Society grants it wide powers, but so far its finances have permitted only two lines of activity, *viz.*, organization and public education. Fortunately these are of basic importance in arousing public interest, moulding public opinion and influencing governments. It is safe to say that the Cancer Society can take considerable credit for what has been accomplished in some of the provinces in the last two or three years.

The scope of the Society's activity during the ensuing year must of course be limited by the amount raised during the campaign next month. The money raised in each

Province will be spent in that Province. Each Provincial Branch of the Society will have to decide on its most urgent needs in dealing with the Cancer problem. In some cases the first charge on the funds may be for a paid secretary, travelling and organizing expenses, literature, moving picture films, etc. Other Branches may be already prepared to consider expenditures on clinics, treatment, transportation, maintenance, "follow-up" measures, laboratory equipment, x-ray machines, radium, scientific, in fact, on any measures which will help in the fight against cancer. It would be a great thing for Canada if the disease could be attacked simultaneously on all fronts, but this must wait until the country is ready to provide sufficient money.

G.S.Y.

HEALTH CONDITIONS AMONGST THE INDIANS

We are publishing a series of papers in this and the following number, on a survey of health amongst our Indian population. Apparently the first attempt at providing medical assistance for the Indians was in 1774. In 1794 the Iroquois of Caughnawaga asked for the appointment of a medical attendant. History repeated itself in its usual way in the assistance given to the Indian Health Services in the war years by the Army and Air Force medical services, because in 1823 also it is recorded that the Indians of Canada East received medical attendance from Army medical officers.

However, it was only in 1905 that a medical service for the Indians was organized under Dr. Peter H. Bryce, who is referred to in the records as "a great humanitarian." But his humanity made such demands that the authorities eventually removed him in 1910. The Indian Health Services now is fully organized, with a total of 27 full time medical officers and several hundred on part time. Sixteen hospitals for Indians are in operation and 24 field nurses; together with many field matrons and dispensers. Regular distribution of medicines is made to every Indian and Eskimo centre.

Apart from their intrinsic interest the papers we publish serve to emphasize the

poor living conditions of at least some of the Indian population. The consequences are inevitably reflected in the extremely high mortality rates from such diseases as tuberculosis and trachoma. In the early days of the settlement of Canada it was smallpox which decimated the Indian tribes, although probably tuberculosis was high too. Now, smallpox has been controlled by vaccination but tuberculosis takes a terribly high toll. Poor housing under rigorous climatic conditions is bad enough, but the additional factor of unsatisfactory nutrition weights the scale hopelessly. Modern processing of food is not blameless in this respect, and the Indian is not to be criticized if he forsakes his original simpler more valuable sources of food, though perhaps more uncertain, for the white flour and tinned supplies which are so temptingly convenient.

As we have shown there has been a steady development of organization for improving medical conditions amongst the Indians and these are being widened continually. It is felt that one of the most direct methods is by means of the family allowances, which are extended to Indians and Eskimos. If the Indian Agent is not satisfied that the Indian is capable of using this allowance, arrangements are made for its administration. In many cases the money is not turned over to the family, but its equivalent in food and clothing is arranged for at trading posts. Recommended lists as regards food are given for the guidance of the traders who supply the Indians, and plain, useful clothing is also obtainable.

It will be obvious what difficulties there are in the medical care of people scattered over such wide areas, and Dr. Corrigan's account is an excellent commentary thereon.

I used to wonder why people should be so fond of the company of their physician, till I recollect that he is the only person with whom one dares to talk continually of oneself, without interruption, contradiction or censure.—Mrs. Hannah More.

EDITORIAL COMMENTS

Control of Radio Interference from Electro-Medical Apparatus Certain

In August 1941, we drew attention to certain Governmental requirements in connection with the use of medical electrical apparatus. These had become necessary on account of the interference with radio communications by electro-medical equipment. During the use of certain types of this apparatus, radio-frequency energy at indiscriminate frequencies is radiated into space for great distances. These radiations can and do cause serious interference with practically all types of radio communication, including aids to marine and air navigation. Legislation was therefore brought in making it illegal to operate in Canada electro-medical equipment functioning on the electric spark discharge principle unless suitable precautions were taken to prevent the interference mentioned.

We are informed that cooperation in this respect has been so good that there is practically no interference from spark-gap electro-medical apparatus. Attention now is called to the necessity for shielding all tube type diathermy machines for similar reasons. The difficulty in obtaining adequate metal shielding is recognized and compliance with the regulations in this respect is extended to January 1, 1948.

The Radio Division of the Department of Transport in Ottawa, will give information regarding names and types of suppressors and screened booths.

Placement For Demobilized Medical Officers

The Canadian Medical Procurement and Assignment Board is making every effort to assist in re-establishing demobilized medical officers in civil practice.

The Board is particularly anxious that returning medical officers should understand the procedure to be followed in their inquiries for medical work. The first source of information to be consulted should be the local Advisory Committee of the Board. There is one such Committee in each Province; it keeps on file general information regarding medical positions, which is made freely available to medical officers. If a position is found to be available in a Province other than that in which the inquiry is being made, the applicant for it should communicate with the chairman of the Committee in that particular Province and be guided by him as to his next step. The details of any appointment are only known by those on the ground, and to avoid confusion and disappointment it is strongly recommended that further informa-

tion be obtained by application to the Divisional Advisory Committee of the Province concerned. Here the full facts are available and will be given to the inquirer.

The chairman of the Divisional Provincial Advisory Committees are as follows:

D.A.C., Ontario, M.D. 1, 2, 3.—Dr. Harris McPhedran, 184 College Street, Toronto 2-B, Ontario.

D.A.C., M.D. 4.—Dr. Frank S. Patch, Room 1161, Sun Life Building, Montreal, P.Q.

D.A.C., M.D. 5.—Dr. W. H. Delaney (Secretary), 322 St. John St., Quebec, P.Q.

D.A.C., M.D. 6.—Dr. James Corston, Cobourg Road, Halifax, N.S.

D.A.C., M.D. 7.—Dr. A. S. Kirkland, the General Hospital, Saint John, N.B.

D.A.C., M.D. 10.—Dr. F. G. McGuinness, Medical Arts Building, Winnipeg, Man.

D.A.C., M.D. 11.—Dr. L. H. Leeson, 203 Medical-Dental Building, Vancouver, B.C.

D.A.C., M.D. 12.—Dr. J. F. C. Anderson, Birks Building, Saskatoon, Sask.

D.A.C., M.D. 13.—Dr. G. R. Johnson, 504 Southam Building, Calgary, Alberta.

D.A.C. for Prince Edward Island—Dr. W. J. P. MacMillan, Charlottetown, P.E.I.

a failure to use it, and to suggest remedies. These unfortunate conditions naturally vary appreciably in different parts of our country, and for different reasons. Only a few years ago many doubted the lack of availability of well established good medical care for all the people, but now it is generally conceded that such a lack exists and if there are still some who doubt it the figures produced from the examination of our citizens for military service should dispel such doubts. The problem of the availability of good medical care has become even more acute in recent years because of the big shifts in population which have resulted from the war effort and which may well continue for some years to come. Where good medical care is available, the failure to enjoy its benefits is all too frequent, for reasons which will be brought out later.

Good medical care includes the activities of the public health services, local, state-wide and federal, and preventive medical procedures, diagnosis and treatment for the individual provided by practising physicians. Of course high standards of medical education and extensive medical research should be included in any good medical care program. Let us consider some of the reasons why a large number of our people do not receive good medical care.

In taking up the public health activities one may ask, are the various public health services, local, state and federal, adequate and evenly distributed throughout the country? Immediately it becomes evident that the amount of preventive medical work carried out by these services varies not only from State to State but also in different localities within the confines of a single State. As there is no evidence that too many public health activities are carried on in any community, and as each year those active in this service are asking for more and more opportunity to extend their activities, it becomes quite obvious that in many localities, if not universally, better public health service is possible and desirable.

This insufficiency in public health services depends upon lack of sufficient legislation to provide the desired amounts of funds and an insufficient number of well trained health officers to cover the country. It will take time to develop enough well trained health officers, but the number entering the service can be increased if sufficient funds are available to attract them. The extension of public health services depends in part at least upon the funds appropriated by our legislatures. Unfortunately, in some instances the practising physicians, so-called organized medicine, do not show enthusiasm for the extension of public health activities. The problem, therefore, becomes one of education of both the laymen and the profession to appreciate the possibilities in public health services and to make them available equally throughout the country. As the

MEDICAL ECONOMICS

THE DELIVERY OF MEDICAL CARE*

By Channing Frothingham, M.D.

Boston, Mass.

At the outset I must confess to ignorance of the Canadian methods of delivering medical care to its people. My talk is based on the situation which exists in the United States and with which I am quite familiar. I hope that there is enough similarity between the problems in the two countries to make my remarks pertinent and of some interest to this group.

Over the years the application of new discoveries in the prevention, diagnosis and treatment of disease has lagged behind the announcement of these discoveries. This lag occurs in different degree in all countries and for a variety of reasons. It is only natural that such should be the case. The medical profession is alert to the situation and is making every effort to diminish this lag; that is not my subject for discussion this evening.

MEDICAL CARE NOT UNIVERSALLY AVAILABLE

Tonight I wish to discuss why there is a lack of availability of well established good medical care for an appreciable part of the population in the United States, or if available

*Address given before the Montreal Medico-Chirurgical Society on December 7, 1945.

States vary in wealth, in order to have the service equally distributed federal aid is indicated.

Turning now from the consideration of the availability of the public health services to a study of the availability of that part of good medical care which is provided by the practising physicians of the country, one immediately finds that many surveys have shown that our physicians, laboratories and hospitals are very unevenly distributed throughout the United States, and in many areas a definite deficiency exists. It is conceded today that good medicine cannot be practised without laboratories and hospitals and available specialists. This uneven distribution of facilities leaves many of our rural areas without sufficient equipment to attract well trained general physicians, to say nothing of specialists. The resulting over-concentration of family physicians and specialists in our urban areas with the expectation of finding suitable equipment produces another difficulty, because in many cities there are not enough well equipped hospitals to offer facilities for all the well trained physicians who crowd into these areas. Naturally a physician dislikes to give up a patient because he has not the opportunity to care for him in a properly equipped hospital, and so he continues to care for the patient in inferior surroundings, be it the home or a poorly equipped hospital, with resulting deterioration of the care.

In addition to the lack of facilities, this uneven distribution of physicians is also due to the inability of a community to properly reimburse a physician on the existing fee-for-service method of payment. To correct the over-crowding of physicians in the urban areas and the lack of them in the rural ones funds must be available to supply suitable hospitals and laboratories where needed, and also to guarantee proper financial return to the physicians. Many local communities are unable to raise such funds, and therefore, the States must provide for their poorer communities. How best the States shall raise these funds is a controversial point. Unfortunately, however, certain of them are not wealthy enough to do so. It, therefore, becomes apparent again that if proper facilities such as hospitals and laboratories are going to be evenly distributed throughout the country and physicians provided, federal aid is indicated for some areas.

Even in those areas where there are a sufficient number of physicians and satisfactory equipment available, organization of the physicians for rendering service is often such that it is difficult to deliver good medical care. The solo practitioner of the past who tackles all medical problems for the individual is of course out-of-date. On the other hand group practice, that is family physicians and specialists in some kind of partnership prepared to deliver fairly complete medical care, has almost always been

successful and its desirability is now generally recognized, although not many years ago organized medicine disapproved. There are enough groups of practising physicians in our country to have a national organization of the managers of those clinics, yet there is also plenty of work for an organization known as Medical Administrative Service, which interests itself primarily in trying to educate the medical profession and the laymen to the necessity of group practice if good medical care is to be available. Obviously there is need for the further extension of group practice in our country, and the education of the people to its advantages.

Another weakness in the organization of physicians for the delivery of good medical care is the failure to limit physicians to practise only the type of medicine or surgery for which they are qualified. Altogether too many physicians learn their specialism on their private patients without proper supervision, rather than on charity patients under proper supervision. Also altogether too many physicians participate to some extent in some special field without limiting their practice to that field, which usually results in an inferior type of specialism. The medical profession is active in trying to classify specialists, and the public should be alert to the need for appropriate selection when special aid is needed. Legislation has been suggested as an aid to the classification of specialists but probably is unnecessary. As the problem of the organization of physicians for rendering good care is an educational one, it does not need federal or State funds in any appreciable amount for its solution.

COST OF MEDICAL CARE

The next problem I will discuss is that of the cost of good medical care, the effect of cost upon availability of care, and how it can be paid for by the citizens of moderate income who, exclusive of the indigent, make up appreciably more than 50% of the population. Good medical care, which as mentioned before includes preventive procedures, early and complete diagnosis and treatment, and the frequent use of specialists, should be expensive under many circumstances. These reasonable but heavy expenses unfortunately are not evenly distributed if paid for on the fee-for-service basis by the recipient of the care, but fall unexpectedly on a limited number often at a time when the unlucky individual is least well prepared to meet them.

This fee-for-service method of paying for medical care by the recipient of the care, whether to individual physicians or groups well organized, is expensive even for simple medical procedures, but in a medical world where consultations with specialists are necessary this method of payment prohibits sufficient consultations on a private patient basis for the great majority of people. This method of

paying for medical care leads many to gamble on avoiding preventable diseases rather than to pay for protection against them. Many try self-medication without proper diagnosis, because it is cheaper. The fee-for-service method of payment by the recipient of the care also stimulates many to go to the cultists with the hope that the cost of their medical care will be less. Alas, many of these unfortunates who employ the cultists pay appreciably more in the long run and still only get a very inferior grade of service. The fee-for-service method of payment by the recipient of the care forces many to become medically indigent, that is to accept charity for their medical care if their medical problems are complicated and need the services of specialists, or destroys the family savings, or plunges the individual into debt. It is obvious, therefore, that this method of paying for medical care is a definite hindrance to its availability to many people, especially those who dislike to accept charity.

It is believed, however, that the whole amount of money spent on medical care through various channels, whether the care is good or bad, is sufficient to pay for good care for all if economically used. The problem is, therefore, to develop some plan for the distribution of this expense among the people in a manner consistent with the individual's ability to pay, and with the assurance that all the people will be given good medical care regardless of location or financial status. Obviously there will always be some who must accept charity, namely, the completely indigent, but some plan for paying for good medical care by those who are not indigent, in proportion to their ability to pay, will remove many from the category of those who now have to accept charity for some of their medical care and are termed medically indigent.

In taking up the question of how best medical care can be paid for to aid in its availability it is pertinent to ask: Is the health of the people the responsibility of government, either local, state, or federal? A survey of existing conditions will make it evident that already local and State governments are involved in the problem of the health of the people, as shown by our public health services, the diagnostic laboratories, the preventive medical preparations, the curative serums, the state institutions, the care of many patients with cancer, tuberculosis, mental disorders, etc., all paid for by the taxpayers' money and at the disposal of the people. Furthermore, some research and some medical education is included in the activities paid for by the taxpayers' money. The survey will also show that the federal government is involved in many of these activities related to the health of the people.

The question asked above, therefore, might well be changed to read: Shall government, either federal, or local, or both, further extend

its activities in its assumption of responsibility for the health of the people?

In so far as government has participated in contributing to the health of the people, the expense has been covered by taxes which are collected from all, and the service made available for all, so that the unfortunate one who happens to need the service does not have to carry the cost as in the fee-for-service method of payment by the recipient of the care. These activities appear to satisfy both patients and physicians because I know of no instances where attempts have been made to take away from government any of the medical activities that have been assumed by government.

That it is desirable to develop some plan for distributing the costs of medical care not already covered by taxation has been mentioned above. The practical question is whether that part of medical care which is not already provided for by taxation, either federal, state or local, should have its costs distributed under some voluntary insurance plan which is satisfactory and reaches all the people, or whether the government should develop a plan to be paid for by compulsory insurance or taxation. A few years ago it was contended by some that prepayment plans to raise money to distribute the cost of medical care were unnecessary. Today I think it is fair to say that the prepayment plan to collect funds for the more even distribution of medical expenses is generally recognized as desirable. Already there exist many voluntary prepayment insurance plans usually organized on an insurance basis to pay directly to the providers for special features of medical care such as hospitalization, surgical fees, special tests such as x-rays, maternity care, etc. Other voluntary prepayment plans, not necessarily based on insurance, exist, which offer varying amounts of medical care to subscribers rather than funds to the providers of this care. This point is of some importance because in many States, if not all, when money is collected from subscribers and payment of money made from those funds, the transaction is regarded as insurance and is subject to the insurance laws. On the other hand when money is collected from subscribers and for it medical service is provided, this transaction is not considered insurance, and therefore does not come under the insurance laws. This gives the chance for this service to be placed under public health where many think it belongs.

It seems fair to say that were there voluntary health insurance or other health service plans for that part of medical care which is not already provided for by government fulfilling the demand, the existing situation would not exist. Although exceedingly successful, the Blue Cross prepayment plans to provide some insurance against hospital bills only cover about 20,000,000 in a population of 140,000,000. The voluntary prepayment plans for medical service

usually by no means comprehensive have less enrollment. There is, therefore, some justification for the belief that these voluntary prepayment plans will not even eventually reach as large a number of the population as would compulsory plans created by government to extend the delivery of medical care further than the government now does, and thus provide for as near as possible complete medical service.

Those who favour further extension of government activities into the field of medical care are asking for a national health program financed by funds collected on a federal basis and with medical care delivered on a local basis by existing facilities and by newly developed ones, and by those physicians who wish to participate under standards developed by those in authority in the national health program. This service would be available to all who are forced to contribute. Being under federal supervision the standards of medical care could be kept at a higher level than our present system permits.

For this purpose President Truman has favoured the development of a national health program to be financed, in addition to what is already being financed by taxation for health purposes by a compulsory insurance program. A constructive program along these lines was presented by Senator Wagner of New York in the 78th Congress by Bill S. 1161 and reintroduced in the 79th Congress by Bills S. 1050 and S. 1606. His original bill has been modified by constructive criticism included in a report of the health program conference prepared by a group of persons interested in the subject brought together by Dr. Michael M. Davis. This report is entitled *Principles of a Nationwide Health Program*.

The details of a national health program will naturally have to be worked out over the years, but the question at the moment is, should a national health program be created by congressional action, or should congressional action be withheld until voluntary plans for the delivery of medical care to the whole population be developed? Those who favour congressional action now feel that voluntary prepayment plans will never reach the large proportion of the population who need this service, and therefore, believe that now is the time for congressional action.

Discussion on the relative merits of compulsory and voluntary health insurance from the viewpoints of completeness and excellence of the medical service and the remuneration for physicians has been going on for some time. Evidence suggests that the National Physicians Committee for the Extension of Medical Service, closely allied with the American Medical Association, does not help the average layman or the physician to reach a reasonable decision upon the merits of the various issues. Prejudiced individuals have claimed that private practice on the present fee-for-service basis to

be paid by the recipient of the care would be abolished. Many other fears regarding what would happen under a federal program for the delivery of medical care have been expressed. The same thoughts were expressed in regard to private education when public education at the taxpayers' expense was instituted approximately one hundred years ago. It is interesting to compare the exaggerated statement presented by the opponents of public schools with the statements presented by the opponents of compulsory health insurance. They are almost identical and still these opponents do not ask for the abolition of the public school system. Furthermore, private education still flourishes and is expanding.

Should the government extend its activities in the problem of the health of the people to give reasonably complete care to all the people who wish to avail themselves of the opportunity one might well ask, why bother with compulsory insurance, why not pay for it from taxation as public schooling is paid for? It might well be so, and I predict it eventually will be. But it is a fact that medical care over the years has been given as charity to the indigent, either through taxation or charitable funds, and the great majority of American people, and rightly so, do not want to be subjects of charity. Therefore, for the moment let us permit the government to provide medical care through compulsory insurance, which is of course a form of taxation, but will not be confused with charity.

Granted that Congress will extend the government's activities in the problem of the health of the people, are the proposed bills before Congress adequate, or can others including those opposed to this philosophy offer a better program? I pass over lightly the criticisms of the details of the program presented in S. 1050 and S. 1606 because experience will eventually change them as needed. I challenge, however, the critics to offer a better substitute for any detail of this proposed legislation that the particular critic considers unsatisfactory. Prejudiced objection without constructive suggestion for improvement or intelligent substitution should not receive serious consideration.

A summary of the defects in our present system of delivery of medical care discussed above and suggestions for their remedy shows need for further public health service to be financed by government; more even distribution of facilities for physicians and of physicians themselves, which will need federal aid for accomplishment; organization of physicians for group practice and better control of professional activities to be developed through education; the abolishment of the fee-for-service method of payment when paid by the recipient of the service for those in moderate circumstances; and some provision for distributing the necessarily high cost of medical care not already

provided by taxation, either by compulsory insurance or further taxation.

The legislation proposed by Senator Wagner offers a method of remedying the defects in our existing methods of the distribution of medical care. If this plan is developed the best of medical care will be available for all and the cost as fairly as possible distributed. The standards of medical care can be kept high as there will be some one with authority to do so. Furthermore, there will be monies available to aid in medical education and research.

One should not close a talk of this sort without mentioning socialized medicine, because some one will undoubtedly use the term in the discussion. The term socialized medicine is carelessly tossed about in discussions regarding the delivery of medical care as though it described a definite entity. Just what one means by socialized medicine is not so easy to define. If by socialized medicine one means medical care paid for by taxation and delivered under governmental supervision, federal, state, or local we certainly have socialized medicine throughout the United States at the present time. Those who are opposed to socialized medicine should perhaps say that they are opposed to the further extension of socialized medicine rather than to socialized medicine as an entity. Those who claim to be opposed to socialized medicine, if really opposed, should be endeavouring to take back from government that enormous amount of medical care which is now delivered by government at the taxpayers' expense, but still no such action is evident.

ASSOCIATION NOTES

A Message from the Wife of the President-Elect

I am speaking in the name of the women of The British Columbia Division of the Canadian Medical Association in offering a warm welcome to our fellow-wives (is there a better word?) in every Province in our Dominion, to the Victory Meeting in Banff next June.

We had hoped to welcome you to Vancouver and had made plans accordingly. But now, force of numbers decrees that the meeting be held elsewhere and so we accept gratefully the pleasant prospect of seeing one another in Banff. I have just been there, and have come away delighted, and am quite sure that the grandeur and unusual beauty of Banff, the varied recreations, and the friendliness of the place and people, promise us all a memorable week in June. For this Victory Meeting—with all its implications of the past, the present, and the future, with the easing of tension for many people, and the natural turning towards natural enjoyment—will in itself be memorable.

In our plans we are trying to leave plenty of time for recreation and for leisure. But there will be several occasions for friendly meeting together. I am instructed to answer the usual question that arises when a woman packs a suitcase or two, namely "What shall I take?"

Remember that at Banff we shall be at an altitude of about 5,000 ft. We may of course have hot days when a thin dress is needed. But it is essential to take with you a woollen suit or dress, a top coat and a sweater; for those who like to walk, comfortable shoes; those who want to enjoy the famous golf course, take your own golf clubs or, if you prefer, you can rent some at the Club House; for those who ride, your riding togs; a bathing suit if you like, although these can be rented at the swimming pools of which there are two within the Hotel and two others not far away, all of them warm. And for the evenings, in the dignity and beauty of the Banff Springs Hotel, each woman will suit her own convenience and taste, in wearing either a short dress or a long dress, whichever she chooses. But if we want to bring out our "long dresses" from where they have lain forgotten during the years of the terrible eclipse—now, at the Victory Meeting, is a very suitable time. I marvel at the condescension and affability of the dignified pages of the *Canadian Medical Association Journal* in lending themselves to the triviality of women's clothes; but we are glad of the opportunity that they have given to us, because every woman, for her convenience and comfort, needs to know what to pack when she goes away from home.

We hope to print our program in the next issue of the *Journal*, and, if necessary, we will give further notes later.

One thing more. If you are coming, and we do hope that you are, we urge you and your husband to make sure of your accommodation as soon as possible, for even the great walls of the Banff Springs Hotel enclose only limited space for the activities of the large numbers who wish to come.

Again a warm welcome from us all.

ETHEL WILSON.

Vancouver,
British Columbia.

Reservations for Annual Meeting

To all medical men and their wives who look forward to attending the Canadian Medical Association meeting at Banff, we have just one thing to say: MAKE YOUR RESERVATIONS NOW. Accommodation is limited to 1,070 at the outside, and after sufficient applications have been received to fill this space, others will have to be refused. Application must be made in writing to the Committee on Housing and Equipment, (see below) and should contain the following details: Name and address (very important), whether double or single, date of arrival and departure.

Read this number of the *Journal* carefully, as it gives details of special interest to ladies who expect to come to Banff. It also gives details regarding rates, housing, etc.

HOUSING

We are asked by the Committee on Housing to draw attention to the following points:

The housing situation at Banff will be a critical one. Not more than 1,070 people can be accommodated, and this only when all available space has been taken, not only in the Banff Springs Hotel, but in other hotels near by. Even this number will tax the dining-rooms, meeting-rooms, etc., and the hotel services to their full capacity. Accordingly, after this number of applications has been accepted, no more will be taken.

Applications may be made either to: (1) The Banff Springs Hotel, direct, or (2) The Committee on Housing and Equipment, 203 Medical-Dental Building, Vancouver, B.C. All applications will be reviewed by the Committee, which will then immediately furnish the manager of the Hotel with the list, and he will then allot rooms in the chronological order of the applications. There is no advantage in either method of application, as the Committee deals with them all. Those who have already sent in their names to the Banff Springs Hotel are already on the list. *No other method of application than that set forth above will be considered.* There are, of course, certain priorities, members of the Council, speakers, certain key men and so on. Otherwise, the order in which applications are received will be the only guide to the manager in allotting space.

Except in cases of physical disability, no members will be allotted single rooms. All those applying singly will be placed two in a room. Members who desire it, may pair off, and send in two names together, thus giving a choice of roommate.

The rates will be a flat \$11.00 a day (American style) irrespective of size and location of room. In charging this flat rate (the only method practicable) there will be no great disparity, as all rooms are good rooms, with bathrooms. Some may have a somewhat better view than others, but as it is doubtful whether any member will be in his room much except to sleep or rest, this will not matter greatly. This flat rate applies only to the Banff Springs Hotel.

A small block of reservations is being held for us at the Mount Royal and King Edward Hotels, which are excellent hotels, thoroughly modern, and very comfortable. Also twenty of Becker's Bungalows, a modern and up-to-date auto-camp, within easy distance of the main hotel. These will be excellent for groups, family or otherwise, as they will accommodate from 4 to 8 persons. The rates at these Hotels and Bungalows will be, of course, somewhat lower than the Banff Springs Hotel rates.

In view of the fact that many visitors will want to take advantage of the famous baths which are a feature of the Banff Springs Hotel, we suggest that visitors should bring their own bathing-suits. The Hotel has a certain number for rent, but may not be able to meet all demands.

TRIPS TO BRITISH COLUMBIA

The visitor to British Columbia, who has only a limited time to spend, would be wise to plan his trip so as to get a maximum of what he wants to see and do, into the time at his disposal. There are three main divisions of the Province, each one of which can fully occupy a holiday, but each one of which is sharply distinct from the others, not only as regards local attractions and characteristics, but also as regards means of transportation, availability and so on.

First, the Coast cities. These include Vancouver, a large modern city of about 400,000 people, with the adjacent cities of New Westminster, and North and West Vancouver. The whole area of Vancouver and New Westminster is gradually becoming one urban area through growth in each direction of the municipality of Burnaby which is a link between the two. Inevitably one day this will be one vast city, with a full complement of industries; these are multiplying apace, and many large manufacturing plants are situated here. New Westminster is the older city of the two, and is situated on the Fraser River, almost at its mouth. The salmon industry was long its chief concern, and the term "Salmon-bellies" given to its inhabitants, is derived from the fact that the soft underbelly of the salmon is the epicure's choice of cuts from this king of fish. But now New Westminster is a port of considerable size and significance, a grain-distributing centre, a manufacturing centre for paper and wooden boxes and boats, and a centre for the products of the agricultural hinterland of the Fraser Valley, one of the richest dairying areas of this part of the world.

Vancouver, of course, as the largest city of British Columbia, has many attractions, including Stanley Park, one of the noblest parks of the world. In June, too, swimming and boating are at their best, and cruises out of Vancouver, to summer resorts and beauty spots, are available to the visitor in any length, from an hour to 48 hours, and to a great variety of attractive places. Good roads offer the motorist excellent trips through the surrounding country. For those who play golf, Vancouver offers seven excellent golf courses—another, a very good one, is to be found in New Westminster, and in West Vancouver is the Capilano Golf Course, one of the finest golf courses in North America. So there is every opportunity to play, and the weather in May and June and July is superb.

Hotel accommodation in Vancouver is good—but there is a tremendous demand, and reser-

vations should be made early. Auto camps are numerous, but they, too, must be spoken for early.

A list of hotels and prices is appended.

The University of British Columbia is situated here, and its site is one of beauty—overlooking the Gulf of Georgia, English Bay, and Howe Sound, all backed by majestic ranges of mountains. Here one sees the Sleeping Beauty, the Lions, and other formations.

HOTEL RATES, VANCOUVER
VANCOUVER TOURIST ASSOCIATION
596 W. Georgia

ABBOTSFORD HOTEL, 921 W. Pender, 110 rooms.
Single with bath, \$3.00; without bath, \$1.50.
Double with bath, \$3.50, without bath \$2.00.
AILSA LODGE, 1020 Melville, 50 rooms, breakfast only.
Single without bath, \$1.50.
Double without bath, \$2.00.
ALCAZAR HOTEL, 337 Dunsmuir, 200 rooms, dining room.
Single with bath, \$2.00, without bath, \$1.50.
Double with bath, \$2.50, without bath, \$2.00.
AMBASSADOR HOTEL, 773 Seymour, 115 rooms.
Single with bath \$2.00, without bath, \$1.50.
Double with bath, \$2.50, without bath \$2.00.
ANGELUS HOTEL, 780 Dunsmuir, 115 rooms.
Single with bath \$2.50, without bath \$2.00.
Double with bath \$3.00, without bath \$2.50.
AUSTIN HOTEL, 1221 Granville, 186 rooms.
Single with bath \$2.50, without bath \$1.50.
Double with bath \$3.50, without bath \$2.00.
BELMONT HOTEL, 1006 Granville, 115 rooms.
Single with bath \$2.50, without bath \$1.50.
Double with bath \$3.00, without bath \$2.50.
CASTLE HOTEL, 750 Granville, 150 rooms.
Single with bath \$2.50, without bath \$1.50.
Double with bath \$3.00, without bath \$2.00.
DEVONSHIRE HOTEL, 849 Georgia, 123 rooms, 2, 3 room suites.
Single with bath \$3.50. Double with bath \$4.50.
DUFFERIN HOTEL, 900 Seymour, 90 rooms.
Single with bath \$2.50, without bath \$1.50.
Double with bath \$3.00, without bath \$2.00.
GEORGIA HOTEL, 801 W. Georgia, 320 rooms, dining room.
Single with bath \$3.00 to \$6.00.
Double with bath \$4.50 to \$8.00.
GROSVENOR HOTEL, 840 Howe, 170 rooms, dining room.
Single with bath \$2.00, without bath \$1.50.
Double with bath \$3.00, without bath \$2.50.
INVERMAY HOTEL, 828 W. Hastings, 40 rooms.
Single with bath \$2.00, without bath \$1.50.
Double with bath \$2.50, without bath \$2.00.
MARBLE ARCH HOTEL, 518 Richards, 150 rooms.
Single with bath \$3.00, without bath \$2.00.
Double with bath \$3.50, without bath \$2.50.
REGENT HOTEL, 160 E. Hastings, 160 rooms.
Single with bath \$2.00, without bath \$1.00.
Double with bath \$2.50, without bath \$1.50.
RITZ HOTEL, 1040 W. Georgia, 2, 3 and 4 room suites.
Single with bath \$3.00. Double with bath \$4.00.
ST. FRANCIS HOTEL, 600 W. Cordova, 75 rooms.
Single with bath \$2.50, without bath \$1.50.
Double with bath \$3.00, without bath \$2.00.
SYLVIA COURT, 1154 Gilford, 62 rooms, 50 apartments.
Single with bath \$2.00, without bath \$1.50.
Double with bath \$3.00 to \$5.00, without bath \$3.00.
VANCOUVER HOTEL, 900 W. Georgia, 560 rooms, dining room.
Single with bath \$3.50. Double with bath \$5.00.

Then we come to Victoria, and even the most fanatic Vancouverite admits that no visit to the B.C. Coast is worth while which does not include Victoria; other parts of Vancouver Island, too, are well worth a visit, but Victoria is

a "must". It is a unique city—not very large, but very much a personality among cities. Victoria has its own atmosphere, reminiscent, as one will immediately be told, of the English type of city, but by no means a copy or an imitation of any other country. A great many of its inhabitants are, it is true, of English or Scotch origin by not more than one or two generations—but they are all very much Canadians, and have merely perpetuated the nicest and pleasantest of the old country ways. Thus there is a pleasant informality about clothes and appearance, a note of casualness and indifference to hurry, a leisureliness and deliberateness of habit that is unusual in the North American tempo but is none the less delightful. It takes some time to get to know Victoria, and nobody crowds you, but it is a city that grows on one more and more.

To medical men we earnestly suggest that they do not on any account miss the "Helmcken house". This is the original house, where Dr. J. S. Helmcken lived and practised almost a hundred years ago. Helmcken was a pioneer in B.C. medicine, and was one of the giants of that day—not only as a doctor, but as one of those who helped establish British Columbia, who gave it law and order and stability, who made it part of Canada, and who laid the foundations of the province well and surely. His house is a small, solidly-built cottage, and contains many relics of great interest. It is now owned by the B.C. Government, and a caretaker is installed who is on hand at regular times to take visitors through and show them everything, with a running commentary on the history and origin of the place.

Victoria has many other things that will leave a pleasant memory. One is Beacon Hill Park, a small but very finished park, with a zoo that is worth seeing, swans and other water-birds, and a noble collection of oak trees. Victoria and its environs abound in oaks anyway, and they do not seem to thrive anywhere else in British Columbia, but they do well here.

Another sight that everyone should see in June is the Butchart Gardens, developed by R. P. Butchart from an old abandoned quarry and some acres of hillside and rock surrounding it. The quarry is a lovely rose garden, and in June is a wonderful sight. The whole place blooms almost the entire year, even in winter violets are to be found, and primroses appear in February.

A list of hotels and resorts of Victoria is appended. But here, as elsewhere, we urge you to make your reservations early.

One leaves Victoria by the Island Highway, which runs north and west along the coast of Vancouver Island for 186 miles through some of the most charming scenery in Canada. A good road branches off it about seven miles out of Victoria, which takes one through Metchosin (an Indian word meaning "stinking fish", but

the reason for it, if it ever existed, is a legend only, and the countryside here is lovely) to William's Head, the Quarantine Station. Here all steamers coming in from the Pacific must report and get medical clearance—here, too, is the "Leper Island" where lepers (at present 2 in number, one Chinese and one Japanese) are kept.

The main Island Highway soon becomes the Malahat Drive, one of the finest scenic drives in the world, rising gradually to a height of 1,250 feet above sea level. Gorgeous views of Finlayson Arm, a long inlet of the sea, are to be had, and the coastal islands (known as the Gulf Islands) can be seen from various points. These islands are, little and big, gems of beauty, and many of the smaller ones are privately owned. Salt Spring Island, one of the largest, has quite a population. Many professional, business, and military men have retired here, from time to time, to spend their declining years. The rate of declining seems to slow down noticeably in these pleasant islands of the West, and the climate is most delightful. It is a drier and warmer climate than that of the mainland, and sheltered from the severer winds. Ferries make these islands accessible, and link them to the shopping and business centres of Victoria and Vancouver.

Nanaimo is the chief town one meets after leaving Victoria, and is an important mining-town, coal having been found here in 1849 by the Hudson's Bay Co. Wellington, Comox, Nanoose Bay are close by. Nanaimo has a direct boat service from Vancouver, 40 miles away by sea. The service is good (two good-sized boats each way daily) and hotel accommodation is good, too.

At Campbell River is the headquarters of the Tyee Club. Anglers have come from every quarter of the globe to Campbell River, to catch the Tyee Salmon (Tyee is the Indian word for Big Chief). To win the gold button of the Tyee Club is the ambition of every man or woman who finds in salmon fishing one of the greatest of sports. They are immense fish, running to seventy or eighty pounds in weight. There are plenty of other fish along this route, however, trout and steelhead and other finny beauties.

Alberni, the Cathedral Grove, Forbidden Plateau, the Malaspina Galleries, with its rock carvings and petroglyphs—Stamp Falls, where the salmon crowd up the river to spawn, the Seymour Narrows—the list is endless. Get guide maps of the B.C. Coast, and plan your trip accordingly. Travelling is easy, over good roads, with good roadhouses and motor camps.

One may obtain further information, road maps, illustrated folders etc., by writing to: B.C. Tourist Bureau; Foster's Travel Bureau; Kathleen Elliott's Bureau, Vancouver.

VICTORIA HOTELS

ANGELA HOTEL, 923 Burdett Ave., 50 rooms.

*Single with bath \$4.00; double \$7.50.

*Single without bath \$3.00-\$3.50; double \$6.00-\$6.50.

DOMINION HOTEL, 759 Yates St., 150 rooms.

†Single with bath from \$2.50; double from \$3.50.

†Single without bath from \$1.50; double from \$2.50.

DOUGLAS HOTEL, 1434 Douglas St., 93 rooms.

†Single with bath from \$2.00; double \$3.00.

†Single without bath from \$1.50; double \$2.50.

EMPEROR HOTEL, 721 Government St., 570 rooms.

(A Canadian Pacific Railway Hotel)

†Single with bath from \$4.00; double from \$6.00.

GLENSHIEL HOTEL, 606 Douglas St., 80 rooms.

†Single with bath from \$2.50-\$3.00; double \$3.50-\$5.00.

†Single without bath from \$1.50-\$2.00; double \$2.50-

\$3.00.

*Single with bath from \$4.00-\$4.50; double \$6.50-\$8.00.

*Single without bath from \$3.00-\$3.50; double \$5.50-\$6.00.

JAMES BAY HOTEL, 270 Government St., 75 rooms.

†Single with bath from \$2.00-\$2.50; double \$3.00-\$3.50.

†Single without bath from \$1.50; double \$2.50.

*Single with bath \$3.50; double \$6.50.

*Single without bath \$3.00; double \$5.50.

METROPOLIS HOTEL, 712 Yates St., 100 rooms.

†Single with bath \$2.50-\$3.00; double \$3.50.

†Single without bath \$1.50-\$2.00; double \$2.00-\$2.50.

NEW CHURCHILL HOTEL, 1122 Government St., 80 rooms.

†Single without bath \$1.50; double \$2.50.

OAKBAY BEACH HOTEL, 1175 Beach Drive, 50 rooms.

*Single with bath from \$6.00-\$8.00; double \$10.00-\$14.00.

OLD CHARMING INN, 1420 Beach Drive, 32 rooms.

(Formerly Oak Bay Hotel)

*Single with bath \$5.00-\$6.00; double \$10.00-\$12.00.

STRATHCONA HOTEL, 919 Douglas St., 100 rooms.

†Single with bath from \$2.50; double \$3.50.

†Single without bath from \$1.50; double \$2.50.

*On application.

WINDERMERE HOTEL, 716 Courtney St., 60 rooms.

†Single with bath from \$3.00; double \$3.50.

†Single without bath from \$1.50; double \$2.50.

*Single with bath from \$5.00; double \$6.50.

*Single without bath from \$3.25; double \$5.00.

All Hotels have dining-rooms and suites without kitchenettes. Special terms for week or longer on application.

APARTMENT HOTELS

THE CATHAY, 855 Douglas St., 26 suites, include kitchen, dinette, and bath.

Single \$4.50 per day (longer periods on application).

Double \$5.50 per day.

Rooms only with bath from \$3.00 per day.

THE KENT, 1322 Blanshard St., 15 suites include kitchen, dinette, and bath. (Cafe)

Double from \$4.00 per day; from \$20.00 per week.

THE SUSSEX, 1001 Douglas St., 38 suites include kitchen, dinette, and bath. (Dining-Room)

Single \$4.50 per day (longer periods on application).

Double \$5.50 per day.

Rooms only with bath from \$4.00 per day.

*American Plan (Room and Meals). †European Plan Rooms only).

"No", a monosyllable, the easiest learned by the child, but the most difficult to practise by the man, contains within it the import of a life, the weal or woe of an eternity.—Johnson.

The General Secretary's Page

As this page is being written, I am on the cold end of a thirty hour mercurial excursion of seventy degrees—from 35 degrees above zero in Vancouver to 35 below on the prairies. Canada's weather, like her scenery and people, offers much diversification and, to those who travel in winter, the changes are often met with kaleidoscopic speed. However, the train is very comfortable. Our Canadian railroads do a grand job in winter and in summer.

But I must halt this eastern diary or this page is going to be written backwards. Ten days ago, Dr. Wallace Wilson, Dr. A. E. Archer and the General Secretary arrived in Winnipeg. Dr. Pat McNulty who this year is guiding the activities of the Manitoba Division, met us and for two days he kept us busily and happily engaged in attending sessions of his Executive Committee, meeting important people and enjoying his hospitality. Our Manitoba colleagues are concerned about the trend of medicine in the Province, particularly Governmental planning, and the Division is considering holding a special meeting to discuss the problem.

The Executive Committee will also put before the meeting a resolution suggesting an increase in the annual fee to \$50.00. Manitoba wants a full time Secretary and realizes that the type of organization required will cost money, and they are prepared to provide it.

Our next stop was Regina, where for two days we met with the Council of the College of Physicians and Surgeons and the Health Insurance Committee. Saskatchewan's C.C.F. Government, especially the Honourable T. C. Douglas who is Premier and Minister of Health, definitely desires to provide medical services to the people on a Health Insurance Plan. The medical profession is fully alive to the implications and has offered its services to the Government by means of a Medical Advisory Committee of which Dr. Archer is a member. The Premier expressed himself as highly pleased to have this Committee available. Come what may in Saskatchewan, the medical profession is not going to be found asleep. Moreover, the Canadian Medical Association which is vitally interested in medical planning in every part of Canada is glad to be associated intimately with the medical profession of Saskatchewan in watching developments there.

From Regina we proceeded to Calgary which, this year, is a suburb of Banff! (which we take over in June). And speaking of Banff, we found the Calgary men keenly interested in doing everything they can to assist our Vancouver hosts in arranging for a most successful Victory meeting. The Calgary Medical Society

in a largely attended meeting, received the three visitors very cordially.

Upon arriving in Banff we were glad to meet Mrs. Wilson, the wife of the President-Elect, Dr. and Mrs. George Johnson of Calgary and Dr. Busteed of Vancouver, all of whom had come to assist in arranging for the convention. Immediately we plunged into conferences with the management of the Banff Springs Hotel, interspersed with what seemed like miles of walking about the palatial structure which is now being dipped in paint and made ready for the summer after four years of wartime slumber. The hotel will be ready and the management and staff will do their part to make the Victory Meeting a memorable one. And, a word to the wise—it is not too early to make your hotel reservations by writing The Canadian Medical Association Housing Committee, Banff Springs Hotel, Banff, Alberta. Bookings are already very heavy and those who apply late may be disappointed. Be sure to indicate the number in your party, time of arrival and how long you expect to stay. The rates are \$11.00 per day per person, two in a room; and \$14.00 per day single; meals included in both rates.

From Banff, we journeyed to Vancouver. There followed several days of strenuous but interesting and satisfactory committee meetings. The Vancouver doctors and their ladies may be quite a piece from Banff, cut off by several mountain ranges, but certainly they have annexed Banff for the week of June 10th. Never has the General Secretary found Committees better organized nor taking their duties more seriously. So, altogether, the "meeting" is in good hands and should be highly successful.

When the Association decided, in 1927 to inaugurate and develop a Hospital Service Department, which, by the way, has been financed entirely by the Sun Life Assurance Company, Dr. Harvey Agnew, a young man of great promise in the profession, was persuaded to become its Secretary, and, for the past eighteen years he has guided the Department with continuous and conspicuous success. But the inevitable has happened. The Department which sponsored the Canadian Hospital Council has seen its child grow up and "come of age", and now the Hospital Council requires all of Dr. Agnew's time as its Executive Secretary. And so we have had to say, not good-bye, but au revoir to a very able and loyal colleague and I am sure that every member of the Association would desire to join with me in wishing him much happiness and satisfaction in the hospital field. Dr. Agnew's new address is 280 Bloor Street West, Toronto.

MEDICAL SOCIETIES

Société médicale des hôpitaux universitaires de Québec

La société médicale des hôpitaux universitaires à l'hôpital Laval, vendredi, le 16 novembre 1945.

DIFFÉRENTS ASPECTS RADIOLOGIQUES MILIAIRES ET NODULAIRES PULMONAIRES.—Jules Gosse-
lin.

Etude comparative radiologique de la granulie pulmonaire, de la broncho-pneumonie, de la silicose, de la moliase pulmonaire, de la tuberculose chronique fibreuse (maladie de Besnier-Boeck possible), de la broncho-pneumonie capillaire et de la broncho-pneumonie d'irri-
tation chimique.

QUELQUES CONSIDÉRATIONS SUR L'AMIANTOSE.
—Louis Rousseau.

Comparativement à la silicose, la symptomatologie réalisée par l'amiantose n'est pas aussi caractéristique. De même les images radiologiques n'ont pas une valeur absolue quoique dans certains cas, elles peuvent se rapprocher des images silicotiques. Le corps d'amiante, à notre avis, a une valeur pouvant permettre d'établir le diagnostic d'amiantose. Cette idée n'est pas partagée par le docteur Gardner de Saranac qui ne croit pas davantage que l'amiantose favorise l'écllosion de la tuberculose.

Résumé de quatre observations de malades ayant travaillé dans l'industrie de l'amiante; l'une correspond à un cas d'amiantose-pure; deux autres en rapport avec une amianto-tuberculose et une dernière où l'amiantose a été mise en évidence par un cancer pleuro-pulmonaire.

Le problème que posent l'amiantose et l'amianto-tubercu-
lose ne paraît pas encore élucidé et des observations cliniques nombreuses ainsi que des études anatomo-
pathologiques sont indispensables pour connaître les désordres attribuables à cette maladie.

SULFADIAZINE ET TUBERCULOSE EXPÉRIMENTALE DU COBAYE.—Maurice Giroux.

L'expérience rapportée consiste dans le traitement d'une tuberculose aiguë du cobaye par la sulfadiazine. Les animaux divisés en quatre groupes, comprennent outre les témoins, trois groupes de cobayes inoculés, et traités respectivement au moment de l'inoculation, après une semaine, et enfin après trois semaines.

Il résulte de cet essai, que la sulfadiazine, qui a une action inhibitrice marquée sur la bacilleme du cobaye, est beaucoup moins effective contre des lésions tuberculeuses en voie d'évolution. L'auteur fait ensuite une revue de l'état actuel de la chimiothérapie de la tuberculose du cobaye.

RHUMATISME ET TUBERCULOSE.—R. Desmeules, L. Rousseau et P. Richard.

Le rhumatisme tuberculeux présente les types cliniques les plus variés s'échelonnant entre la polyarthrite aiguë fébrile, type Bouillaud, et la polyarthrite chronique défor-
mant, type Charcot.

Pressenti par Laennec et Corvisart au début du XIX^e siècle, observé cliniquement par Poncet et Leriche, établi sur des bases biologiques par l'école lyonnaise, ressuscité par Bezançon et Weill, le rhumatisme tuberculeux est une entité morbide qui reçoit de plus en plus fréquemment sa confirmation bactériologique par l'intermédiaire du milieu hautement sensible de Loewenstein. La clinique procède généralement par l'élimination progressive des autres facteurs étiologiques et établit le bien-fondé de l'hypothèse tuberculeuse par des méthodes biologiques, par l'étude des antécédents héréditaires et collatéraux des malades et par la vérification bactériologique des déterminations viscérales ultérieures ou concomitantes aux accidents rhumatismaux.

Le laboratoire donne de plus en plus fréquemment dans les formes aiguës, parfois dans les formes subaiguës et chroniques la preuve bactériologique. Quant aux autres données biologiques, elles ne contribuent qu'à renforcer l'hypothèse clinique.

Il ne faut pas borner l'étiologie du rhumatisme à des infections focales ou à une infection générale à cause jusqu'ici inconnue, à la diathèse goutteuse, aux maladies vénériennes, à un trouble endocrinien mais envisager la tuberculose, et spécialement la tuberculose pulmonaire, maladie endémique par excellence, et l'une des plus fréquentes infections qui soient parmi les humains, civilisés comme l'un des facteurs possibles.

Les auteurs établissent le diagnostic de l'étiologie tuberculeuse de deux polyarthrites par élimination des autres causes et ils apportent dans une troisième observation la preuve expérimentale grâce à la mise en évidence du bacille de Koch dans le liquide articulaire.

RÉSULTATS D'UN RÉGIME BALANCÉ SUR LE POIDS DE TUBERCULEUX HOSPITALISÉS À L'HÔPITAL LAVAL.—J. Ernest Sylvestre.

Cette communication expose en premier lieu que sur 334 adultes hospitalisés à Laval au 1^{er} janvier 1944, 76.3% pesaient 7% et plus au-dessous du poids moyen lors de leur admission. Les femmes accusent une proportion plus élevée (80.5%) que celle des hommes (73.1%); chez les enfants de moins de 13 ans (au total 79), cette proportion n'est que de 49.4%.

Le régime des malades, basé sur les recommandations faites par le Conseil Canadien de la Nutrition, fut suivi d'assez près au cours de l'année 1944. En vue d'apprécier la valeur de ce régime, on a étudié l'évolution du poids des malades présents au 1^{er} janvier et admis au cours de l'année. Voici en résumé les constatations notées: 67.5% des adultes (au total 285) ont engrangé et chez les enfants (au total 82) 85.4%. Si on admet que c'est un succès que de maintenir stationnaires ceux qui pèsent le poids moyen et de ne pas laisser maigrir jusqu'au-dessous du poids moyen ceux qui pèsent 10% au-dessus du poids moyen, nous pouvons alors affirmer que le régime alimentaire chez nos malades a réussi dans 73.1% des cas chez les adultes et dans 97.6% des cas chez les enfants.

Clinical Meeting at No. 1 Canadian General Hospital, Canadian Forces, Netherlands, December 4, 1945

This meeting was held at the hospital, Nijmegen, Holland. The excellent attendance of medical officers from army troops and other formations reflected the interest taken in hospital activities. It was expected that this would be the last clinical meeting to be held in a Canadian hospital in the Netherlands.

The guest speaker, Dr. P. J. Gaillard, was introduced by Lieut.-Colonel R. Johnston. He explained how Dr. Gaillard, as a member of the Faculty of Leiden University, an institution particularly persecuted by the Germans, carried on his research during the occupation under very trying conditions. He was finally removed to a German concentration camp just a year ago the day of this meeting because of his affiliation with the Resistance Movement.

Colonel Johnston pointed out that Leiden University holds particular interest for Canadians. Through the intellectual leadership given to clinicians from Edinburgh by Herman Boerhaave, the Medical School of the University of Edinburgh was founded, with emphasis

on clinical bedside teaching. This tradition was carried in turn to McGill University Medical School by its first faculty members. So it might be said that McGill Medical School is an intellectual grandson of Leiden University. This traditional relationship is commemorated in the Medical Library at McGill by a window showing the name of Herman Boerhaave, the first physician to introduce bedside clinical instruction into medical education.

Dr. Gaillard prefaced his address on "Tissue culture in medical practice" by expressing the pleasure and honour he felt in being invited to speak to the gathering and hoped that the occasion would emphasize the good relations between Canada and Holland and especially the R.C.A.M.C. and the University of Leiden.

Pointing out the possibility of culturing animal or human tissues in the classical medium of blood plasma and pressed juice of young embryos as was done by Carrel, Dr. Gaillard focused his attention on the cultivated explants from the standpoint of their use for medical purposes.

Since anti-anæmic liver extracts can only be standardized clinically, the attempt was made to develop a biological standardization using bone marrow explants of young guinea pigs. This method depends on the measurement of the migration of cells from isolated bone marrow imbedded in a coagulum of plasma to which various concentrations of liver extract have been added. This migration is increased at certain optimal concentrations and becomes an index of the potency of the liver extract. Using this method the speaker and his co-workers were able to show that the optima caused by the addition of various concentrations of liver extracts were absent when bone marrow and media from thyroidectomized animals were used.

He then described the use of tissue explants in the study of morphological differentiation of cells. It has been shown that in culturing all sorts of tissue fragments, there are only two principal types of cells which finally survive, *i.e.*, morphological dedifferentiation occurs. Only the fibroblasts and epithelial types remain. Osteoblastic cell cultures never develop bone, fibroblastic cells from muscles never develop to muscle cells and so on. In attempting to understand this phenomenon these workers were struck by the fact that there was considerable difference in the rate of growth between cultures of the fibroblastic type cultivated in serum of the adult and those cultivated in the press juice of 8 day old embryos. The growth is very much faster in the latter. Furthermore, the concentration of the medium seemed to be important. From all this it was concluded that during ontogenesis there are distinct and systematic differences in the composition of body fluids. In addition, fibroblastic cells derived from the

heart of a seven days' old chicken embryo reacted each in its own way, indicating the special physiological properties of these cells which are morphologically alike.

By culturing in ascending age ranges of press juices the stimulation of histological differentiation was attempted. This was done by refreshing the first medium of an 8 day embryo by the juice of a 10 day embryo, two days after the beginning of the experiment. Two days later, 15 day embryo press juice was used to refresh the ten day old embryo press juice and so on. After culturing for about 12 days in this manner, real bone developed in the midst of the explants. It was concluded that the structure of explanted tissue is highly dependent on the composition of the culture medium. This principle was demonstrated as well with several other types of explanted tissues. Moreover, the cultivation medium influences the physiological properties of the cells as well, because the explants of the pituitary gland of the rabbit lost their hormone producing capacity when in embryonic media but held that capacity for many weeks by growth in the media derived from the adult animal.

The problem next considered was that of homo-transplantation in the adult man. To be successful the transplanted tissue or organ must grow, live or function normally in the new host. This has not been possible apparently except in the case of one egg twins or sometimes between mother and child or between brothers and sisters. Neither is it possible among other higher animals unless the tissues or organs are taken from newborn animals or embryos. This latter is known as brephoplasty transplantation.

The speaker then went on to describe how he and his colleagues tried brephoplasty transplantation on man. Carefully treated little pieces of the skin of a newborn grew and lived on large skin defects for more than five to six months, after which time it was rather difficult to discern whether the original transplants were still present.

Next tried was the brephoplasty transplantation of cultivated parathyroid explants to patients suffering from postoperative tetany. The parathyroid glands were obtained from a premature or mature fetus. Each gland was cut into 8 or 10 very little pieces. One piece was fixed for histological control and the others were cultured in media consisting of blood plasma from the adult mixed with a little quantity of serum from the future host. In the following days the percentual quality of the host serum was increased and finally only the blood plasma of the future host was used. On the basis of the earlier research complete adaptation of the explants to the serological qualities of the future host was awaited. For transplantation, the explants which liquefied the coagulum and

covered themselves with a thin epithelial layer were carefully selected.

A cultivation period of 14 days seemed to be sufficient for the explants and then 8 to 12 of them (together about 2 c.mm.) were washed in physiologic salt solution for a short time. The explants were injected together with this fluid into the perivascular lymph space of an axillary vein prepared by the surgeon. The patients were mobilized after a week and were observed for a long time, particularly with reference to calcium and phosphorus blood levels.

Two cases treated in this way were cited.

CASE 1

A boy of 19 years, following a strumectomy in 1942 developed a severe tetany. He refused any treatment until February, 1943, when he came to the hospital with severe symptoms. His blood calcium was 4.5 and phosphorus 7. After transplantation March 5, 1943, his subjective symptoms disappeared and his chemical picture gradually improved and in three months' time it was almost normal. On July 24, 1943, the blood calcium was 11.8 and phosphorus 4.1. The patient is still well and without any signs of tetany.

CASE 2

A woman of 25 years, who had a strumectomy in 1941, began four weeks later to develop symptoms of severe tetany. On November 20, 1941, her blood calcium was 5.2 and phosphorus 7.8; hormonal therapy was immediately started. After some months the blood picture was practically normal (February 5, 1942, blood calcium 10.1 and phosphorus 4.75) but the clinical picture was not satisfactory. The hormone therapy was stopped January 23, 1943, and on February 4, some cultivated parathyroid gland fragments were implanted in the perivascular lymph space of the left axillary vein. The clinical symptoms disappeared and the chemical blood picture remained normal. But in June, 1943, a pregnancy started and six months later slight symptoms reappeared. Because of the pregnancy some hormonal treatment was given. The baby was born on March 16, 1944 and soon afterwards the mother reported severe headache and fatigue. Her blood calcium was found to be 16, and phosphorus 4.1.1. The treatment was immediately stopped, the symptoms disappearing some days later. Now she is completely well.

Dr. Gaillard said that biphloplastic transplantation of cultivated material is successful and further, transplants from a mature fetus give a better result than those from premature ones; and patients under thirty react far better than the older people.

He concluded by expressing the hope other diseases of ductless glands would react favourably to biphloplastic transplantation of cultivated and adapted fragments.

THE SURGICAL DIVISION

Captain Howard Hamlin presented a case of a British soldier who suffered a thoraco-abdominal wound and who survived without operation. The missile penetrated the left chest at the level of the eighth rib in the posterior axillary line, causing a hæmo-pneumothorax. It then passed across the body to lie presumably in the right lobe of the liver. The study of the course of the missile as demonstrated in a cross section of an abdomen

and thorax was very interesting, when compared with x-ray films showing the progress of the hæmo-pneumothorax.

The decision not to operate was made and by close observation and supportive treatment the patient recovered and has been evacuated.

Major Samuel McFetridge presented four fracture cases in which internal fixation had been carried out.

Lieut.-Colonel Johnston led the discussion on these cases. The lessons learned in fracture work during the war were mentioned and the value of single screw fixation of fractures of the radius and tibia was stressed.

In regard to fractures of the femur, the intramedullary pegging operation using a Kuntscher nail was explained. This method of fracture treatment has become familiar to Canadian surgeons serving on the Continent. There appears to be a place for the method in fractures of the upper one-third of the femur in adults, provided skilled personnel are available for the operation and for the x-ray control and the necessary manipulation which must be carried out. Fractures of the femur are notorious in the army for the length of time which is necessary to obtain good solid union and also for the residual disability. Any method which would aid in reducing these two factors should be closely investigated and adopted if found suitable.

Following the Clinical Meeting, refreshments were served in the Nursing Sisters' Mess.

LIEUT.-COL. R. A. Y. JOHNSTON,
O. i/c Surgery,

No. 1 Canadian General Hospital.

The Western Canada Division of the Canadian Anæsthetists Society

The Western Canada Division of the Canadian Anæsthetists Society is holding a meeting in Winnipeg, March 15 and 16. There will be clinical meetings at the Winnipeg General, St. Boniface Hospital and Deer Lodge. Formal papers will be read and there will be round table discussions. Dr. Ralph Knight will be the guest speaker. A ladies' program has been arranged and all interested in anæsthesia are invited to attend.

"True glory is the unanimous approbation of good men, for their praise is not bought with money, and they alone are able to estimate real merit at its proper value."—Cicero.

UNIVERSITY NOTES

McGill University

In recognition of the increasing importance of anesthesiology in modern surgery, McGill University has recently announced the establishment of a Department of Anesthesia, within the Faculty of Medicine, under the Chairmanship of Dr. Wesley Bourne, of Montreal.

In order to qualify physicians expertly to fulfill the functions of the modern anesthesiologist, the Department of Anesthesia, at McGill, has established a three year training course for postgraduate students called the Diploma Course in Anesthesia. Twelve students, mostly former medical officers in the armed services, are already enrolled. Clinical experience is provided by rotating residencies in a number of co-operating hospitals and didactic teaching by lectures and laboratory work in the Department of Physiology, Anatomy, Pharmacology and Biochemistry. Weekly conferences are held to discuss interesting cases and other anesthesia problems. Undergraduate teaching in anesthesia is also being organized on a much more comprehensive basis than in the past.

Dr. Wesley Bourne (M.D. '11, M.Sc. '22), has long been recognized internationally as an authority on anesthesia, and he has contributed eighty-five articles to various medical journals. His pharmacological research on the relation of anesthetic agents to liver function, the impurities of ether, the use of di-vinyl ether, the importance of oxygen and on the use of barbiturates in obstetrics, have been particularly valuable.

In 1933, Dr. Bourne was the first recipient of the Hickman Medal, awarded by the Royal Society of Medicine, in London, for outstanding contribution to the progress of the science and art of anesthesia. He has served as President of the American Society of Anesthesiology, the International Anesthesia Research Society, the Section of Anesthesia of the Canadian Medical Association, and he is, at present, Vice-President of the Canadian Anesthetists Society. Associated with Dr. Bourne, in the new Department of Anesthesia, are the senior anesthetists of leading Montreal hospitals.

Further details of the staff and organization of the Department of Anesthesia will soon be announced by McGill University.

"The end and object of a rational constitution is to do nothing rashly, to be kindly affected towards men, and in all things willingly to submit unto the gods."—Marcus Aurelius.

MISCELLANY

"The King Is Dead, Long Live The King!"
[An editorial in "The Medical Times", August 1945]

After the vitamins, what? What is there on the horizon likely to take the place of, or at least overshadow the vitamins? We are thinking especially of exploitation of the laity and assuming that the touting of hormones and penicillin, despite the latter's lack of toxicity, will be controlled. Enterprise being what it is a succession can safely be assumed. After the greatest possible clean-up in such matters a decline is naturally to be expected and a new gold mine, yielding \$250,000,000 per annum, must be struck. Along with this phase there is also scientific progress for which, in itself, we are duly grateful.

The amino-acids seem to us to offer the most potential possibilities at present; they have the same single or shot-gun availability as the vitamins; a similar magical myth can be conceived of in their case; the concept of the amino-acids as the building blocks of which the protein molecule is constructed lends itself marvellously to nutritional and therapeutic wizardry, both real and phony; and since the proteins differ from each other specifically, the food supply must furnish the particular amino-acids necessary for building the specific proteins in the cells, which suggest the possible range of real or alleged deficiencies to be corrected, especially in the field of the chronic degenerative diseases by way of prevention and cure; it will not be many years before people will wonder how we of today managed to live without large auxiliary supplies of the amino-acids as essential elements in our budgets.

There are many signs that the amino-acids are in line and pressing forward. The shout will soon go up, we suspect, of "The King is dead, long live the King!"

The populace is familiar with thiamin, riboflavin, ascorbic acid and all the rest of the royal family now reigning. But we must learn to visualize a bank clerk, in 1948, purchasing a bottle of tryptophan capsules with the same assurance as if he were buying Smith's non-carcinogenic cigarettes (another gift reserved by the gods for the near future).

It will be no more of a feat for a public which knows pantothenic acid, alleged banisher of gray hair (of rats!), to familiarize itself with some or all of the new princes and princelets, if our surmise is sound; to wit: tryptophan (crown prince), glycine, alanine, valine, leucine, isoleucine, serine, phenylalanine, tyrosine, threonine, cystine, methionine, aspartic acid, glutamic acid, B-hydroxy glutamic acid, arginine, histidine, lysine, proline, norleucine, and hydroxyprolin.

Our super-propagandists will take care of all that when the time comes. Look what the *Reader's Digest* did for testosterone propionate.

CANADIAN MEDICAL WAR SERVICES

MEDICAL OFFICERS APPOINTED TO THE R.C.A.M.C.—ACTIVE FORCE

DECEMBER, 1945

(Previous sections in January, March, April, May, June, July, September, October, November and December, 1945 and January, 1946.)

SECTION LXIII

Name	Address	Date of Appointment	Name	Address	Date of Appointment	Name	Address	Date of Appointment
Beaulieu, M., Quebec City		26-9-45	Leeot, A., Ninette, Man.		23-11-45	Thomas, J. R., Winnipeg		1-11-45
Floyd, L. S., Winnipeg		5-11-45	Polson, R. A., Fort Garry, Man.		25-10-45	Weaver, K. S., Regina		1-11-45
Helgason, R. E., D'Areys, Sask.		1-11-45	Pratt, M. C., Winnipeg		29-10-45	Woolner, W. S., Canadian Army Overseas		18-9-42
Hennigar, G. R., Halifax		6-9-45	Schulman, I., Saskatoon		1-11-45			

MEDICAL OFFICERS STRUCK OFF STRENGTH OF THE R.C.A.M.C.—ACTIVE FORCE

DECEMBER, 1945

SECTION LXIV

Name	Address	Date struck off strength	Name	Address	Date struck off strength	Name	Address	Date struck off strength
Allen, H. W., Winnipeg		13-11-45	Geggie, J. H. S., Wakefield, Que.		5-11-45	Moscovich, J. C., Vancouver		20-10-45
Anderson, J. J., Regina		26-10-45	Gillen, C. W., Brantford, Ont.		13-11-45	Moss, J. K., Hamilton		7-11-45
Andreae, A. J., Toronto		20-9-45	Gould, C. E. G., Vancouver		4-10-45	Neilson, J. B., Hamilton		17-11-45
Argue, F. J., Toronto		10-11-45	Grainer, T. R., Weston, Ont.		14-11-45	Nutik, H. L., Montreal		14-11-45
Armstrong, T. W., Welland, Ont.		7-11-45	Gray, C. C., Toronto		1-9-45	Ohlke, R. F., Parry Sound, Ont.		2-11-45
Balinson, R. H., Hamilton		3-11-45	Greer, K. C., Toronto		21-11-45	Palmer, J. H., Westmount		14-11-45
Barrie, J. G., Winnipeg		6-11-45	Haig, K. J., Vancouver		24-10-45	Patten, R. W., Chilliwack, B.C.		16-11-45
Bearden, W. A., Neudorf, Sask.		9-11-45	Heaton, T. G., Toronto		9-11-45	Ridge, J. M., Winnipeg		22-10-45
Becker, A., Davin, Sask.		7-11-45	Holland, G. A., Montreal		22-11-45	Ritchie, K. S., Montreal		31-10-45
Bethune, C. M., Halifax		13-11-45	Inglis, A. M., Gibson's Landing, B.C.		31-10-45	Roberts, L. N., Toronto		12-11-45
Biehn, J. T., Sarnia, Ont.		19-11-45	Keene, J. D., Mazenod, Sask.		29-10-45	Robson, G. W., Regina		14-11-45
Bird, G. A., Victoria		23-10-45	Kilgour, J. M., Montreal		28-11-45	Rosenfeld, V. L., Winnipeg		27-11-45
Bowers, N. S., Kingston, Ont.		20-11-45	Kirsch, A., Westmount		5-11-45	Roy, T. E., Montreal		20-11-45
Bowes, G. C., Montreal		6-11-45	Kobrinsky, S., Winnipeg		24-11-45	Saunders, F. E., Vancouver		20-10-45
Boxer, L., Swift Current, Sask.		6-11-45	LaPlante, J. P. A., Granby, Que.		6-11-45	Savisky, M. F., Prince Albert, Sask.		15-11-45
Brien, F. S., Windsor		8-11-45	Leggett, W. G., Toronto		31-10-45	Shapley, J. M., Toronto		18-10-45
Bugg, W. J. F., London, Ont.		9-11-45	Leishman, J. D., Winnipeg		31-10-45	Simpson, W. W., Vancouver		20-10-45
Caldwell, R. M., Aylesford, King's Co., N.S.		14-11-45	Levinne, N. N., Toronto		7-11-45	Sinclair, A. B., Toronto		22-11-45
Cameron, M. G., Toronto		6-11-45	Lunan, J. B., Montreal		3-11-45	Slayer, J. H., Dartmouth, N.S.		25-10-45
Cardy, J. deV., Edmonton		13-11-45	Lynch, D. O'G., Woodstock, Ont.		30-10-45	Smillie, R. A., Niagara Falls, Ont.		4-10-45
Casselman, B. W., Sault Ste. Marie, Ont.		13-11-45	MacDonald, J. A., Hastings, Ont.		10-11-45	Smith, G. F., Toronto		30-8-45
Chestnut, H. W., Winnipeg		28-11-45	MacDonald, N., Windsor, Ont.		6-11-45	Smith, T. C., Kingston, Ont.		20-11-45
Chisholm, M. J., New Waterford, N.S.		14-11-45	McGuire, M. G., Brockville, Ont.		9-11-45	Sormany, A. H., Edmunston, N.B.		16-10-45
Cock, J. G., Newmarket, Ont.		17-11-45	MacKinnon, C. G., Bridgewater, N.S.		11-10-45	Stephens, C. W., Vermilion, Alta.		10-11-45
Conley, A. E., Ottawa		15-11-45	MacLean, H. M., Moncton, N.B.		1-11-45	Stiles, E., Albert, N.B.		21-10-45
Crawford, C. S., The Pas, Man.		1-11-45	MacMillan, J. A., Vancouver		6-11-45	Streets, C. W., Fort Erie North, Ont.		3-11-45
Curtis, E. J., Vancouver		30-10-45	McNeill, C. G., Tashme, B.C.		12-10-45	Sutherland, H. F., Glace Bay, N.S.		28-9-45
Day, C. S., Toronto		10-11-45	Mader, V. O., Halifax		15-11-45	Talbot, H. S., Brewster, New York, U.S.A.		22-11-45
Dinan, J. J., Montreal		1-10-45	Madorsky, M. L., Toronto		8-11-45	Taylor, A. H., Goderich, Ont.		22-10-45
Dobie, F. C., Port Arthur, Ont.		16-11-45	Magner, D. E. O'C., Toronto		11-10-45	Taylor, G. D. L., Montreal		6-11-45
Duffy, J. C., Chatham, N.B.		17-11-45	Metcalfe, H. G., Timmins, Ont.		7-11-45	Tritt, J. H., Fort William, Ont.		8-11-45
England, N. J., London, Ont.		14-11-45	Misener, C. C., Crediton, Ont.		1-11-45	Vale, B. W., Toronto		10-11-45
Ewen, W. J., Port Arthur, Ont.		9-11-45	Mitchell, M. D., Winnipeg		14-11-45	Walton, F. A'C., Winnipeg		5-11-45
Fedder, J., Toronto		16-11-45	Moir, H. K., Toronto		21-11-45	White, I. S., Port Coquitlam, B.C.		14-11-45
Fell, W. A., Victoria		4-9-45	Montgomery, S. R. P., Toronto		17-11-45	Will, R. E., Barrie, Ont.		10-11-45
Ferguson, G. C., Port Arthur, Ont.		21-11-45	Mooney, W. C., Vancouver		14-11-45	Young, S., Moose Jaw, Sask.		15-11-45
Fish, H. W., McLennan, Alta.		2-11-45			10-11-45	Zender, R. J., Edmonton		4-12-45
Fleming, J. M., Bala, Ont.		6-11-45						
Frank, H. F., Langstaff, Ont.		6-11-45						
Frost, A. C. G., Vancouver		27-10-45						

MEDICAL OFFICERS APPOINTED TO THE R.C.A.M.C.—ACTIVE FORCE
JANUARY, 1946

SECTION LXV

Name and Address	Date of Appointment	Name and Address	Date of Appointment
Doyle, William James Bernard, 49 Union St., Simeoe, Ont.	31-12-45	Phankuf, Irene Alice, 167 Bertrand St., St. Boniface, Man.	30-10-45
Feinstein, Myron Sanford, 72 Harrow St., Winnipeg	20-11-45	Young, Arthur Frances, Box 23, Emo, Ont.	1-11-45

MEDICAL OFFICERS STRUCK OFF STRENGTH OF THE R.C.A.M.C.—ACTIVE FORCE
SECTION LXVI

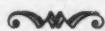
Name and Address	Date struck off strength	Name and Address	Date struck off strength
Aiello, Emilio, Pincher Creek, Alta.	8-12-45	Clarke, Kenneth Andrew Connal, 1219 Riverdale Ave., Calgary	4-12-45
Aitken, Donald Woodrow, 304 Lauder Ave., Toronto	4-12-45	Clayton, Amos Benjamin, Chesterville, Ont.	22-11-45
Albert, Samuel Salomen, Outremont, Que.	28-11-45	Cloutier, Edward, Ansonville, Ont.	6-9-45
Albert, Saul, 947 Dunlop Ave., Outremont, Que.	3-1-46	Clover, Albert Moore, 174 Earl St., Kingston, Ont.	22-9-45
Anderson, Earle Howard, 14 Amesbury Ave., Apt. 101, Montreal	13-12-45	Colquette, Clifford Bruce, 317 Carlton St., Toronto	4-12-45
Armour, William Edward, Toronto	10-12-45	Conn, Robert Stanley, 811 McCallum Hill Bldg., Regina, Sask.	4-12-45
Arnold, William Christopher, 63 Robert St., Ottawa	8-12-45	Conway, Michael Aloysius Alan, Box 907, Kirkland Lake, Ont.	6-12-45
Ashkenazy, William, 751A Champagneur Ave., Outremont, Que.	19-11-45	Cooperberg, Arthur A., 680 Wiseman Ave., Outremont, Que.	13-12-45
Austmann, Kristjan Jonsson, 957 McMillan Ave., Winnipeg	17-11-45	Coffey, Theodore Henry, St. John T.B. Hosp., East Saint John, N.B.	20-10-45
Hazin, Alfred Randolph, 5754 Somerled, Apt. 3, Montreal	6-12-45	Corston, James McDiarmid, 46 Coburg Rd., Halifax	14-12-45
Begg, Herbert Napier Crawford, Cadomin, Alta.	3-12-45	Cragg, Bertram Harry, 54-4th St., New Westminster, B.C.	13-12-45
Begg, Robert William, 348 Robie St., Halifax	7-12-45	Dales, Charles Weston, 274 Vaughan Rd., Toronto	19-12-45
Berger, Maurice, Estevan, Sask.	13-11-45	Dalrymple, Thomas, 1870 Ogden St., Vancouver	5-12-45
Bice, William Kenneth, 135 Inkerman St., London, Ont.	24-11-45	Dauphinee, James, 35 Ava Road, Toronto	31-8-45
Bissell, Edgar Shewell, Mallorytown, Ont.	6-12-45	Davidson, Ian William, Parry Sound, Ont.	23-11-45
Blanchard, Allan John, Hamilton General Hospital, Hamilton, Ont.	30-11-45	Dawson, Joseph Calvin Crawford, 296 Frederick Ave., Peterborough, Ont.	7-1-46
Blott, Gordon Richard, 9732-87 Ave., Edmonton	5-1-46	De Beaupre, Ernest John J., Chauvin, Alta.	27-10-45
Blumenfeld, Edward Alexander, 129 St. Joseph Blvd. W., Montreal	26-11-45	Dobson, Creighton Robert, 10750 125th St., Edmonton	20-11-45
Boddington, George David Mitchell, 333 Bloor St. W., Toronto	22-11-45	Douglas, Richard Proudfoot, Clinton, Ont.	8-12-45
Booth, Marvin Lee, Wallaceburg, Ont.	2-1-46	Downey, Joe LeRoy, Winnipeg	5-11-45
Boothroyd, Wilfred Ernest, 77 Allen St., Halifax	11-12-45	Duff, Gordon Alexander, 19 Regent Street, Port Arthur, Ont.	29-11-45
Borrowman, Almer, Melvin Wallace, 291 London Rd., Sarnia, Ont.	28-11-45	Duncan, Ernest Howard, Regina, Sask.	27-11-45
Bourbonnais, Adolphe Earl, Coteau du Lac, Que.	18-12-45	Dunham, Burtt Talmadge, Nelson, B.C.	19-11-45
Bourgeois, Clifford Raymond, Tracadie, N.B.	5-11-45	Dunlop, Thomas Conklin, Toronto Hosp. for Consumptives, Weston, Ont.	8-10-45
Boyd, Alvie R. J., 6657 Laburnum St., Vancouver	14-12-45	East, William Henry Sparling, Winnipeg General Hosp., Winnipeg	5-12-45
Bracken, Allan Douglas, 81 Roslyn Rd., Winnipeg	19-11-45	Elliott, Morley Robinson, 2 Locarno Apts., Roslyn Rd., Winnipeg	1-12-45
Brown, Ronald Earl, Balcarres, Sask.	24-10-45	Eshoo, Homer, Misericordia Hosp., Winnipeg	5-12-45
Brunton, Lauder, 3600 McTavish St., Montreal	4-1-46	Ferguson, Rober, 2300 Tupper Ave., Montreal	19-10-45
Burton, Glen Stewart, 69 Queen's Cres., Kingston, Ont.	21-11-45	Findlay, John Anglin, 987 McMillan Ave., Winnipeg	16-11-45
Bustin, Howard Barlow, 17 Seeley St., Saint John, N.B.	7-11-45	Finklestein, Mitchell, 1507-15th Ave., Regina, Sask.	14-11-45
Byers, Wilmer Mason, Metcalfe, Ont.	13-12-45	Fitzgerald, Gerald Walker, 40 Isabella St., Apt. 203, Toronto	19-12-45
Campbell, Donald Dennison, 462 Brunswick Ave., Toronto	8-11-45	Flett, Robert Ormondy, 644 Ashburn St., Winnipeg	16-11-45
Campbell, Hudson McMillan, Elgin, Ont.	30-11-45	Fowler, Arthur Coulson, Perth, Ont.	28-9-45
Campbell, James Malcolm, 1301 Elliott St., Saskatoon, Sask.	13-12-45	Fraleigh, Sydney Bruce, Box 764, Petrolia, Ont.	27-12-45
Chapman, Eric Francis, Vancouver	2-1-46	Fralick, Francis Traill, 121 Mt. Pleasant Rd., Toronto	14-12-45
Christie, John Victor, 102 Bruce Ave., South Porcupine, Ont.	30-12-45	Gander, Thomas Alfred, Box 411, Peace River, Alta.	19-12-45

Name and Address	Date struck off strength	Name and Address	Date struck off strength
Gardner, Campbell McGregor, Montreal General Hospital, Montreal	8-12-45	McCullough, Allan Whitten, 31 Pallister Apts., 370 Stradbrook St., Winnipeg	30-11-45
Gardner, John Smith, 11147 82nd Ave., Edmonton	20-11-45	MacDonald, Joseph Baxter, Montreal General Hospital, Montreal	12-12-45
Geddes, John Hardy, 314 Grosvenor St., London, Ont.	5-10-45	MacFarlane, J. A., 58 Bernard Ave., Toronto	17-10-45
Gilhooley, Joseph Patrick, 6 Range Rd., Ottawa	10-11-45	McInerney, James Peterson, 52 Douglas Ave., Saint John, N.B.	27-11-45
Gliddon, Edward Cecil, 30 William St., St. Thomas, Ont.	12-11-45	McIntosh, Clarence Alexander, 3480 Cote des Neiges Rd., Montreal 24	3-10-45
Gold, Allen, 406 Pine Ave. W., Montreal	28-11-45	MacKeen, Robert, Arthur Haliburton, Rothesay, N.B.	4-1-46
Goldstein, Phillip, 338 W. 14th St., Prince Albert, Sask.	8-12-45	McKibbon, Walton Allan, Wingham, Ont.	1-12-45
Goodman, Benjamin, 518 Ave., 1 South, Saskatoon, Sask.	19-12-45	MacKinnon, William Burns, 192 Canora St., Winnipeg	12-11-45
Gosselin, Adrien, 280 Ste. Foye Road, Quebec, Que.	21-11-45	MacLean, Thomas Keith, 953 W. 26th Ave., Vancouver	27-11-45
Gow, John Alexander, 11 Sydenham St., Dundas, Ont.	4-12-45	MacLennan, Alexander Havelock, Edmonton	22-9-45
Green, Andrew Calder, 187 Arthur St., Port Arthur, Ont.	8-12-45	MacLennan, John Archibald, 389 Sunset, Windsor, Ont.	19-11-45
Gregory, Alexander Warren, Lambeth, Ont.	19-11-45	McLeod, James Gordon, 2300 College Ave., Regina, Sask.	4-1-46
Griffith, George Smith, Holdfast, Sask.	20-12-45	McNeil, Burdett Harrison, 48 Braemar Ave., Toronto	3-1-46
Gundry, Charles Hegler, 5709 Cartier Ave., Vancouver	13-12-45	McNichol, John Frederick, 1 Queens Square, Galt, Ont.	12-12-45
Harcourt, John Adam Alexander, 907 College St., Toronto	11-12-45	Malkin, Solomon, 145 Machray Ave., Winnipeg	12-11-45
Hastings, Donald James, Winnipeg	27-12-45	Manson, Arthur Bennett, 925 W. Georgia St., Vancouver	2-10-45
Haszard, John Francis, Kimberley, B.C.	1-11-45	Merkeley, Norman Paul, Winnipeg General Hospital, Winnipeg	11-12-45
Haughton, Thomas Joseph, Assiniboia Club, Regina, Sask.	28-11-45	Merritt, John Willis, 120 John St. W., Waterloo, Ont.	27-11-45
Howard, Michael Joseph, 340 McKay St., Ottawa	12-12-45	Metcalfe, Earl Vincent, 90 Locust St., St. Thomas, Ont.	5-1-46
Ironstone, Paul Stanley, Gogama, Ont.	24-11-45	Midgley, George Harold, 78 Water St. S., Galt, Ont.	27-11-45
Jackson, Barton Alexander, 71 Milner Ave., Bury, Lancs., England	25-10-45	Miller, Stephen John Charles, 386 Burwell St., London, Ont.	11-1-46
Jessel, Sam John, 66 Nassau St., Toronto	20-11-45	Mills, Jesse Richard Frank, 38 Heddington Ave., Toronto	5-12-45
Johnson, Archibald McNeill, Vancouver General Hospital, Vancouver	2-11-45	Milne, Douglas Robert Stuart, 1557 West 57th Ave., Vancouver	5-12-45
Johnston, William Sanders, 526 King St., London, Ont.	21-11-45	Milner, Frederick John, 76 Tecumseh Ave., London, Ont.	27-11-45
Kennedy, Edward Gordon, 190 George St., Belleville, Ont.	14-11-45	Mulvihill, Louis John, Shaunavon, Sask.	14-12-45
Kenney, Athol Stewart, 65 Suffolk St., Guelph, Ont.	27-11-45	Munro, Carman Benjamin, 526 Clark Ave., Montreal	5-12-45
Kilpatrick, Carman Douglas, Box 83, Blyth, Ont.	19-12-45	Murphy, Arthur Birmingham, 35 Russel St., Smith's Falls, Ont.	26-11-45
Kingstone, Henry, 24 Manning Ave., Toronto	27-11-45	Murphy, William James, 135 Rodney St. W., Saint John, N.B.	20-10-45
Kirby, John William, 457 Avenue Rd., Toronto	5-1-46	Murray, Robert Stanley, 107 Queen St., Stratford, Ont.	11-12-45
Kirkbridge, Roy Arthur, 4429 Melrose Ave., N.D.G., Montreal	4-12-45	Mustard, William Thornton, 5 Cawthra Square, Toronto	4-1-46
Kirkpatrick, Gordon MacKay, 2930 Pine St., Vancouver	30-11-45	Myers, Charles Arthur, Box 45, Brussels, Ont.	4-1-46
Korman, Morris, 259 Winona Drive, Toronto	2-12-45	Myers, Frederick Cleophas, Fonthill, Ont.	1-12-45
Kruger, George Walter, Toronto Western Hospital, Toronto	15-12-45	Myers, Robert Fraser MacIntosh, 90 Arlington St., Winnipeg	16-11-45
Laidlaw, Thomas Angus, Sussex, N.B.	5-12-45	Negru, John Harvey, 1527 Burnside Place, Montreal	5-12-45
Lathe, Grant Henry, 1254 MacKay St., Apt. 3, Montreal	4-1-46	Neilson, James Paton, Debolt, Alta.	29-11-45
Latimer, John Wilfred, Seeley's Bay, Ont.	8-12-45	Nichol, John Eric, 145 Aylmer Ave., Ottawa	20-11-45
Latour, Guy, 159 Grande Allee, Quebec, Que.	10-11-45	Nix, Harold Leake, Red Deer, Alta.	4-12-45
Lazareck, Isadore Luke, 616 Aberdeen Ave., Winnipeg	5-12-45	Noble, James Arnold, 27 Willot St., Halifax	18-10-45
Lea, Richard Gordon, 268 Larch St., Sudbury, Ont.	18-12-45	Norton, George Iveson, Cardston, Alta.	19-12-45
Leblond, Sylvio, 307 St. Joseph St., Quebec, Que.	2-12-45	Palmer, Harold Ira, 17 Church St., Brantford, Ont.	6-12-45
Levine, Robert Marcus, 3410 Atwater Ave., Apt. 21, Montreal	4-12-45	Pascoe, William Wolf, Wakan, Sask.	1-12-45
Lewin, George William, Stamford Centre, Ont.	5-12-45	Patterson, Eric Baker, Box 103, Paris, Ont.	28-9-45
Lewis, Clarence Hassard, Apt. 208, 2 Sultan St., Toronto	4-12-45	Pendrigh, Robert Murray, West Saint John, N.B.	19-12-45
Lindsay, Peter Bryson, Dundalk, Ont.	24-7-45	Perrett, Thomas Stewart, 195 E. Main St., Welland, Ont.	18-12-45
Lyons, Ruvin, 22 O'Meara St., Winnipeg	15-11-45	Perrin, Maitland Boyd, 130 Brock St., Winnipeg	21-11-45
McConnel, Frederick Lorne, Longueil, Que.	8-11-45		
McCrimmon, Donald Ross, 772 Sherbrooke St. W., Montreal	30-11-45		

Name and Address	Date struck off strength	Name and Address	Date struck off strength
Peterson, Edward Reynolds, 404-4th Ave., Saskatoon, Sask.	20-12-45	Smolkin, Samuel, Almonte, Ont.	15-11-45
Pidutti, Joseph Anthony, 8 Centre St., Portsmouth, Ont.	20-12-45	Soucie, Joseph Ernest Guillaume, Moonbeam, Ont.	18-12-45
Portugal, Aubie, 309 Church Ave., Winnipeg	10-11-45	Spohn, Peter Howard, 1945 Barclay St., Vancouver	4-1-46
Potter, R. Thomas, 267 Charles St., Belleville, Ont.	20-12-45	Squires, Arthur Hunter, 56 Spadina Road, Toronto	14-12-45
Ptak, Lumir Louis, 805 Gordon St., Victoria B.C.	7-12-45	Statten, Page, 428 Russell Hill Road, Toronto	29-11-45
Quinn, Louis James, 4872 Cote des Neiges Rd., Apt. 4, Montreal	23-11-45	Stewart, Charles Allan, 206 Victoria St., Chatham, Ont.	11-12-45
Raxlen, Benjamin, 1 Wells Hill Ave., Toronto	8-11-45	Stoffman, Isaac Wilfred, Weyburn, Sask.	24-9-45
Reeves, Robert Leslie, Civic Hospital, Ottawa	13-11-45	Swartz, David, 336 Glenwood Crescent, Winnipeg	28-11-45
Rice, Raymond Manning, R.R. 4, Victoria, B.C.	6-12-45	Taylor, Herbert LeRoy, 53 Hallam St., Toronto	27-11-45
Rice, Robert Gerald, Children's Mem. Hosp., Montreal	11-12-45	Temple, Allen Dorrien, 4394 Girourard Ave., Montreal	1-12-45
Richards, Charles Alvin, Tillsonburg, Ont.	12-12-45	Thomson, Charles Alexander, 114 St. James St., London, Ont.	27-11-45
Rider, Robert Crawford, 490 English St., London, Ont.	4-1-46	Tonning, Henrik Odd, Black's Harbour, N.B.	20-11-45
Roberts, James Baggs, 331 Duckworth St., St. John's, Nfld.	18-12-45	Trask, Carl Raymond, 31 Vernon St., Halifax	7-12-45
Robertson, Joseph Angus, Campbellford, Ont.	10-11-45	Truax, Alfred Jacques, 18 Wellesley St., Toronto	5-1-46
Robinson, Ralph Baldwin, 173 Lowther Ave., Toronto	12-12-45	Turnbull, Andrew Ross, 158 Dunlop St., Barrie, Ont.	27-11-45
Rochon, Guy Antoine, Farnham, Que.	27-11-45	Vaisrub, Samuel, 8 Mitchel Blk., Centra Ave., Prince Albert, Sask.	3-12-45
Rodrigue, Gaston, Compton, Compton Co., Que.	5-12-45	Van Luven, Otto, Consecon, Ont.	6-11-45
Ross, Alexander Cameron, 108-1st St., New Westminster, B.C.	7-12-45	Wainwright, George Arthur, General Hospital, Hamilton, Ont.	6-10-45
Ross, James Wells, 133 Dunvegan Rd., Toronto	4-12-45	Wales, William Fenwick, Hospital for Sick Children, Toronto	10-12-45
Ross, William Harold, 30 Main St., Potsdam, N.Y.	4-12-45	Walker, John Hutton, 238 Langley St., London, Ont.	2-1-46
Rubin, Mitchell, Foam Lake, Sask.	19-11-45	Walker, Joseph Alphonse Leo (No address available)	12-12-45
Rumball, Albert St. Clair, 401-22nd St., Brandon, Man.	7-12-45	Walsh, George Charles, Vancouver	18-12-45
Scott, George Du Colon, Ontario Hospital, Fort William, Ont.	25-9-45	Ward, Clifford Vincent, 4669 Grosvenor Ave., Montreal	4-1-46
Scarow, Gordon Robert, 178 Talfourd St., Sarnia, Ont.	22-12-45	Watson, Gerald Lorell, 1270 W. King Edward Ave., Vancouver	14-12-45
Scott, Henry, 3906 Quesnel Dr., Vancouver	14-12-45	Weber, John Joseph, 339 Brant St., Woodstock, Ont.	4-12-45
Scott, Paul Andrew, Picton, Ont.	3-9-45	White, William Haynes, Penticton, B.C.	17-11-45
Searle, Abraham, 602 Manitoba Ave., Winnipeg	14-11-45	Whiteside, William Carleton, 215 Birks Bldg., Edmonton	3-12-45
Shannon, James Grant, 4625 Grand Blvd., Montreal	24-11-45	Whytock, Harry Whishart, 89 Charlton Ave. W., Hamilton, Ont.	4-12-45
Shklov, Nathan, Vancouver General Hospital, Vancouver	12-12-45	Williams, Charles Daniel G., 34 King George's Rd., Toronto	10-11-45
Sieniewicz, Thaddeus, Halifax, N.S.	23-11-45	Woodbury, John Francis Lydiard, 105 South Park St., Halifax	12-11-45
Simpson, Robert Nelson, Manitowaning, Ont.	28-11-45	Woolner, William Stewart	14-12-45
Slemon, Harold Virtue, Toronto Western Hospital, Bathurst St., Toronto	5-1-46	Wride, Reginald John, Princeton, B.C.	4-12-45
Smaill, William Donald, 124 Fourth Ave., Ottawa	29-11-45	Yaffe, Stephen Adria, 37 Aikman Ave., Hamilton, Ont.	21-12-45
Smith, Charles Gordon, Kirkland Lake, Ont.	13-11-45	Young, Harvey Gordon, 202 Scott Bldg., Moose Jaw, Sask.	4-1-46
Smith, Harold Osborn, Ingersoll, Ont.	10-12-45	Zale, Charles, 251 Palmerston Ave., Toronto	16-11-45

SECTION LXVII

Died (Overseas)	Date of death	Died (Overseas)	Date of Death
Carson, William Harry, Southampton, Ont.	18-12-45	White, Julian, Toronto	10-11-45



CORRESPONDENCE

The Multiplicity of Specialists

On the premise that Dr. Hill has a legitimate "moan" because of "The Multiplicity of Specialists", [January issue] I wish to reply to his effusion of abuse of the so-called racketeering of the medicos.

In the first instance, the patient was a physician, and would not be liable to tariff by her confrères. However, for the sake of argument, let us suppose the patient to be a lay person. As in most other fields of endeavour the medical profession operates on a "supply and demand basis". If the services of a specialist are "demanded" in a particular locality, and he or she can eke out a compensatory livelihood, then the specialist stays; if the demand is below par, then there are only three courses to pursue. First, remain as a specialist and starve to death; secondly, remain and do general practice with a "leaning towards the specialty"; or thirdly, move to a community with a greater demand for the particular specialty.

There are no countries in the world where the practice of medicine and surgery and their variant ramifications have better served everybody than in Canada and the United States of America. No one doctor can be a specialist in everything. Unquestionably, the general practitioner is the backbone of the profession. There are however occasions when "special" advice is requisite or it may be imperative. Hence the "multiplicity of specialists".

In this particular case, the doctor in attendance was caring for another doctor, and naturally desired that everything possible should be done. There are occasions when the specialist's services are required to correct situations and conditions that were not foreseen until it was too late. Circumcision and the obliteration of a small birth mark are admittedly minor procedures, yet, there is an aesthetic standard, much more important to some people than to others.

The alleged professional racketeer is usually a doctor who spends three or more mornings each week at some hospital, giving his services gratis. If you have no money, or represent the low wage class, then you can be seen for nothing at the hospital clinic; if on the other hand, you are in a fair earning capacity or privileged, then you must seek an appointment at his office.

The public is extremely gullible. To employ the services of an insincere general practitioner or specialist for some special reason in preference to the attention of a recognized conformist to the teachings of Hippocrates; and then in disgust or grief, heap condemnation on the profession generally, is being most irrational.

The war is over. Thousands of doctors are leaving the services to resume their life's work. They sacrificed more than words can tell during

the long years away from their community. They return humbly and with piety; they have seen the grimdest of reality; they have served their country well; and now, they wish to serve their communities, not as a multiplicity of specialists, racketeers or what have you, but as doctors, faithful in the trust!

D. V. HUTTON, O.B.E., M.D.
363 Waverly Road,
Ottawa, Jan. 18, 1946.

Religion and Medicine

To the Editor:

Dr. Martin's article on "Religion and Medicine" (in the January *Journal*) was opportune and interesting. In times such as we are passing through now, such a broad minded approach to one of the most important factors in our human relationships should help every one to adjust themselves properly to this changing world.

No doubt some M.D.'s may say there is little scientific in the article,—possibly not. But in the midst of the broad period of re-adjustment and evolution that we find ourselves in, some of the faith of our fathers surely is a help to us all. Anything to help our human relationships is worth while studying. We all must help each other and be brothers in a world brotherhood or perish from the earth.

Personally I would like to see more similar articles and also hear the views of any who have something definite to offer in place of them. It is only by getting the truth out of all faiths and all science and living that truth every day that we can attain our ultimate destiny and preserve our species from destruction.

Yours very truly,
W. W. READ, M.D.
574 Claremont Ave.,
Westmount, Que.

[The following appeal has been received from the Secretary of the Greek War Relief Fund.]

To the Editor:

We have been advised by the Greek Red Cross that they are in great need of surgical instruments and hospital supplies.

Several doctors, friends of our Fund, have suggested that we make an appeal through the Canadian Medical Association to doctors and hospitals throughout the country for any outmoded instruments or other supplies that they might have and which are no longer being used by them. There might also be some available from estates.

These instruments and supplies will be a great help to the doctors in hospitals throughout Greece which were systematically looted by the retiring enemy.

We shall be most grateful if you will bring this matter to the attention of your Committee

and if possible approach your various members in behalf of this worthy cause.

B. C. SALAMIS,

National Secretary, Greek War Relief Fund.
December 13, 1945.

Prostatitis and Non-Specific Urethritis

To the Editor:

With reference to the article on Chronic Prostatitis associated with Non-Specific Urethritis, by Cooper and MacLean, in your February issue, the following are some observations made while serving in Holland last year, which it is hoped may be of interest.

During the spring and summer of 1945 non-specific urethritis became common among the members of the Canadian Forces in Holland. As the article referred to above points out, alcoholic and sexual excess are relevant factors, and these were to say the least common at the time. Many cases were observed in personnel just returned from leave. A large proportion of those reporting sick with a complaint of urethral discharge were dispatch riders and jeep drivers; chiefly the former, who usually spent the greater part of the day on motorcycles. However, as the observations were made at the R.A.P. of an R.C.A.S.C Transport column, it is safe to assume that the majority of the personnel seen spent long hours riding.

The presenting symptom was a urethral discharge, which varied from a scanty bead of mucus on rising to an equally scanty thin, slightly cloudy discharge appearing at intervals through the day. Because of the emphasis placed on the importance of such a symptom in the army program of V.D. training, the condition was a great source of worry to the soldiers concerned, and several cases of V.D. obsessions were seen. Perineal discomfort was present in most cases; urinary symptoms such as burning were scarce. Pain across the lumbosacral region was common, but might have been either referred pain from the prostate or direct pain from chronic trauma.

Prostatic examination was done on all cases, and showed a normal picture; most patients said that the prostate was tender on the first examination. Cultures were not done, but smear usually showed "pus cells occasional, no organisms". A fair number gave a history of a previous attack of frank gonorrhoea or acute non-specific urethritis, but I do not think that these were in the majority.

Various local and systemic treatments were tried at first, from penicillin to KMnO₄ irrigations, and finally a bi-weekly "finger-wave parade" was instituted, without much improvement.

The frequency of cases increased in the spring and summer. This may have been due to (a) the length of time spent in doing intensive

driving; (b) the more irritating quality of the alcoholic beverages available in Holland; (c) increased opportunities for sexual indulgence, which were supplied by the increasing number of displaced persons, among whom personal hygiene was not at its best. Among those questioned, the majority admitted that sexual excitability was increased during long hours riding in vehicles.

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That there are certain advantages to be derived from the abolition of the selling of practices is also generally recognized; particularly is this true of the younger men who have spent anything up to six years in the Forces and are now returning to civilian life, many of them married and with family ties. For such men the necessity to find the capital to buy a practice (even with the help of the low rates of interest arranged by the B.M.A.) would mean much hardship in many cases. The major criticism evoked by the proposal is lest it should involve unnecessary interference with the professional freedom of the practitioner and the

adoption by the Government of powers of direction of the practitioner to whatever part of the country may be ordained by the powers that be. That such risks are involved is undoubtedly true, but it should not be difficult for a scheme to be evolved whereby a fair distribution of doctors can be obtained without undue interference with this freedom.

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An innovation in the report this year is a reference to the incidence of non-notifiable diseases. Reference is made to special inquiries which show that "during an average quarter of the year six out of every ten civilians of working age suffered from an illness (not necessarily keeping them from work) or complained of a minor ailment of some kind". It is figures such as these that give a truer picture of the health of the nation than the conventional figures usually

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Much is already being done, both by voluntary organizations and by local authorities. Glasgow, for instance, has built a block of flatlets for elderly women and has been inundated with applications. These flatlets, which are let at 10s. a week, inclusive of rates and hot water, consist of a room with a sleeping alcove, a vestibule and a kitchenette.

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and if possible approach your various members in behalf of this worthy cause.

B. C. SALAMIS,

National Secretary, Greek War Relief Fund.
December 13, 1945.

Prostatitis and Non-Specific Urethritis

To the Editor:

With reference to the article on Chronic Prostatitis associated with Non-Specific Urethritis, by Cooper and MacLean, in your February issue, the following are some observations made while serving in Holland last year, which it is hoped may be of interest.

During the spring and summer of 1945 non-specific urethritis became common among the members of the Canadian Forces in Holland. As the article referred to above points out, alcoholic and sexual excess are relevant factors, and these were to say the least common at the time. Many cases were observed in personnel just returned from leave. A large proportion of those reporting sick with a complaint of urethral discharge were dispatch riders and jeep drivers; chiefly the former, who usually spent the greater part of the day on motorcycles. However, as the observations were made at the R.A.P. of an R.C.A.S.C Transport column, it is safe to assume that the majority of the personnel seen spent long hours riding.

The presenting symptom was a urethral discharge, which varied from a scanty bead of mucus on rising to an equally scanty thin, slightly cloudy discharge appearing at intervals through the day. Because of the emphasis placed on the importance of such a symptom in the army program of V.D. training, the condition was a great source of worry to the soldiers concerned, and several cases of V.D. obsessions were seen. Perineal discomfort was present in most cases; urinary symptoms such as burning were scarce. Pain across the lumbosacral region was common, but might have been either referred pain from the prostate or direct pain from chronic trauma.

Prostatic examination was done on all cases, and showed a normal picture; most patients said that the prostate was tender on the first examination. Cultures were not done, but smear usually showed "pus cells occasional, no organisms". A fair number gave a history of a previous attack of frank gonorrhœa or acute non-specific urethritis, but I do not think that these were in the majority.

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mother" is to live on the premises to be available to help with nursing and shopping. Much is heard these days of the medical care of the aged, but there can be little doubt that it is social measures such as these that will prove of more value in maintaining the health and happiness of the steadily increasing number of old people in our midst.

WILLIAM A. R. THOMSON.
London, January, 1946.

THE NATIONAL HEALTH SERVICE

Parliament has reassembled and is faced with a program of legislation which will, if carried into effect, have a profound influence upon the life of every citizen in these Islands. High up on the priority list is the Bill dealing with the national health service, and that it is not only the medical profession that is keenly interested in this Bill is evident from the headlines accorded in the daily press to any pronouncement, however vague, that the Minister of Health cares to make on the subject.

The Government's proposal will probably be published before the end of this month, but all that can be said at the moment is that negotiations have been proceeding between the Minister and the Negotiating Committee sponsored by the British Medical Association. Mr. Bevan has categorically stated in public that he does "not propose to interfere with private practice at all". All he proposes to do is to "organize a medical service which shall be free to the whole population". In other words, there will be no compulsion for doctors to join the new service, but should they not do so, they will be left to their own devices and need expect no assistance or sympathy from those responsible for the national service.

That Mr. Bevan fully appreciates the immensity of the task which faces him in attempting to have his Bill passed by Parliament by the end of the summer, is shown by his disappointing admission that the industrial medical service is not to be integrated into the new national service.

THE NATIONAL INSURANCE BILL

Three years have passed since the momentous Beveridge Report on social insurance was presented to Parliament, and the New Year opens auspiciously with the presentation to Parliament of the National Insurance Bill. This historic landmark in the social history of the country will always be associated with the name of Sir William Beveridge, even though it differs in certain respects from the proposals of the original report.

Coming as it does at the present moment, it constitutes a striking tribute to the confidence of the nation in its ability to ride the storm of post-war economic and financial disturbances. The cost of the proposed benefits in 1949 is estimated at £452,000,000, rising to £496,000,000 in

1955, and the Exchequer share in 1949 will be £118,000,000, rising to £143,000,000 in 1955. The Bill covers sickness and unemployment benefits, retirement pensions (the new name for old age pensions), widows and orphans, maternity benefits and death grants, and the standard of benefits can be gauged from the fact that sickness benefit will amount to 26s. a week, with 16s. for a dependent and 7s. 6d. for the first child, and this is to be paid without limitation of period.

Two aspects of the Bill are of particular interest to the medical profession. First and foremost, it relieves our patients of practically all financial worry during sickness—a powerful addition to our therapeutic armamentarium. Equally important is the tremendous responsibility such freedom from want on the part of our patient lays upon our shoulders, for obviously the financial solvency of the scheme is to a large extent dependent upon most scrupulous standards of certification. It is, indeed, a striking tribute to the high standing of the profession that the assumption of such a responsibility should be taken for granted.

DEMOBILIZATION

A recent acceleration in the rate of demobilization of medical officers has gone far to meet the demands of civilian practice. All three services have settled the proportion of doctors to be retained at two per 1,000 members, and acting on this decision doctors are now being released at a rapid rate, so that the 5,000 doctors which the British Medical Association asked should be released by this winter, should soon be back in mufti. This, however, leaves one outstanding problem, namely, that of the calling up of doctors to maintain the requirements of the services. Newly qualified doctors are still being called up after six months as house officers, and senior men, up to the age of 40, are also being recruited as specialists.

What is now clearly required is a definite statement from the Government as to how long this state of affairs is to be maintained, and, more important still, how long these men will be expected to serve before being demobilized. Closely interwoven with this problem is that of the conditions that are to rule in the post-war services. There are quite a number of doctors who have served during the war who would be prepared to accept permanent commissions, provided they know what the conditions would be. These men would not be prepared to accept the conditions, financial or professional, prevailing before the war, but, provided a reasonable standard of pay was introduced along with extended scope for clinical work, a considerable number would be prepared to accept permanent commissions. This is a problem that involves all branches of the services, and it is becoming increasingly difficult to understand the delay in the issuing of an authoritative statement on the subject.

THE NATION'S DIET

The bulk of informed medical opinion in this country supports the Prime Minister in his recent refusal to give an undertaking that general rations should not be raised so long as there is famine on the continent of Europe. What Mr. Attlee described as our "present monotonous and unexciting diet" cannot be reduced any further without deleterious effects upon the health of the nation, and indeed there are many doctors who feel strongly that unless our rations are shortly increased, the health of the people will suffer. The subject is one that has been debated keenly in both the medical and the lay press, and many wild statements have been made on both sides. The truth of the matter, of course, is that we are neither a well-fed nor yet a starving nation. The lower paid sections of the population have benefited from the skilful rationing system introduced largely on the instigation of Lord Woolton and Sir Jack Drummond, but the over-all picture is one of definite deterioration of our dietetic standards since 1939. Fresh fruit is becoming more readily available, but there is a definite shortage of fat in our diet which results not only in a dietary deficiency but also in great difficulty in providing any variety in the preparation of food. Whatever the experts may say, the average housewife over here would feel much happier about the diets of the members of her household if she could only have a little extra fat, bacon and cheese.

WILLIAM A. R. THOMSON

London, February, 1946.

EXTRACTS FROM CORRESPONDENCE IN OTHER JOURNALS

Psychiatry in the Services

(Here is a subject indeed—important, contentious, full of variety. The most recent discussion of it by correspondence, was begun in the *British Medical Journal* of October 13, 1945, by W./C. K. G. Bergin, R.A.F., in a letter which had all the qualifications for provoking controversy.)

"I shall be interested to hear the views of others concerning the part that psychiatry has to play in the disposal of many cases which come under the review of a Service doctor and which are not dealt with by specialists in other branches of medicine. To send a patient to the neuropsychiatrist is frequently the refuge of the diagnostically destitute, the results, in my experience, often being most disappointing. I refer to those cases which present certain well-known features, such as headaches, dizziness, lack of confidence, depression (with or without suicidal tendencies), lack of emotional control, temperamental instability, vague muscular pains, insomnia, bad memory, and multitudinous digestive disorders, coupled with inability to carry out their appointed duties. Having received a clean bill of health from all other specialists

they are handed over by the unit medical officer in desperation to the neuropsychiatrist for diagnosis and disposal. The neuropsychiatrist will in most cases extract a typical history, including many, if not all, of the following features: nail-biting, childhood bed-wetting, fear of the dark, anorexia and insomnia, functional impotence, and, in some cases, upset over domestic or Service matters.

"The first step on the downward path is now taken. A diagnosis of anxiety state is made, the medical category is lowered, and the patients' overseas service restricted. Almost without exception on returning to their unit they deteriorate steadily, until, in desperation, the final scene is enacted, and they are invalidated out. I contend that this course is unsatisfactory and immoral. The patients' weaknesses, whether real or alleged, are pandered to, and a chronic state of neurotic invalidism is engendered, which makes them a burden to all concerned, including themselves.

"A unit medical officer can observe these cases between the time they are told they will be invalidated and the date of their actual discharge. What a transformation we now behold! The lame leap for joy, the blind see, and dyspeptics eat large indigestible meals without apparent discomfort. Why this miraculous change? What healing balm has been applied? What unction bestowed? In my opinion these people have, by conscious or unconscious deception, achieved their object. Instead of uniform they will wear civilian clothes; instead of a barrack-hut, the comforts of a home; instead of discipline, independence. I will quote a few examples of many that I have seen personally. An N.C.O. at one time quite incapable even of light duty is now running a large greyhound business with great success (and commensurate profit). A girl who could hardly walk from exhaustion and fatigue now does a heavy day's work as a civilian waitress (on excellent pay). Another N.C.O., who had outbreaks of weeping on being asked to work overtime, now he knows he is to be invalidated, can be seen merrily cycling home five miles to work in his garden.

"I have become very cynical of such cases. I feel that many of them think that if they make life sufficiently intolerable for their colleagues and the medical officer they will attain their object—as in many cases they do. The melancholy results obtained are not the fault of psychiatrists, unit medical officers, or the executive, but of a system which permits this escape mechanism for those unwilling to bear the heat and burden of the day—a system which lays too much stress on psychological illness and not enough on a man's responsibility to his fellows. Previously such patients had my sympathetic attention, but now I refer more and more cases to the executive for disciplinary action, with the most surprising and gratifying results. In a recent case of a senior N.C.O. dealt with in this manner he decided that hard work was more acceptable outside prison than inside."

The response was rapid and plentiful. W. L. Milligan (Oct. 27) feels that:

"... we who profess to be psychiatrists would do well to ponder and give the matter much consideration. In the past too much stress has been laid on the academic and scientific aspects of psychological medicine, and the sociological implications have not received the attention they deserve. This broader view can be achieved only when psychiatry is accepted as an integral part of the social service of the community and not segregated as a little-understood and narrow specialty."

and extracts from some of the other correspondents are as follows:

"Wing Cmdr. K. G. Bergin's experience differs entirely from that of all serious writers on the subject of Service neurotics in two respects—their progress after invaliding and their response to disciplinary measures. Careful follow-ups on patients who had been invalidated out of the Services for neurosis were done by Lewis (*Lancet*, 1: 167, 1943) and Ferguson (*Health and Industrial Efficiency*, H.M.S.O., 1943), it being found that the great majority were still seriously incapacitated after months of civilian

life. I have encountered many patients of this type who had been harshly dealt with by the executive because of their failure to meet the demands made upon them or their supposedly malingering propensities. In each case the results were disastrous, and a completely useless individual, often with a very great nuisance value, was produced. Such eminent psychiatrists as Ebaugh (*Manual of Military Psychiatry*, W. B. Saunders, Philadelphia, 1944) on the other side of the Atlantic and Hadfield (*British Medical Journal*, 1: 281, 1942), on this have emphasized the unfortunate consequences of treating these patients as malingers. Neurotic symptoms are very real, and the man or woman in a state of pathological anxiety and depression finds it more difficult to lead a normal active life than does a healthy person. A refusal to recognize this produces a strong sense of injustice and grievance and has a most harmful influence.

"It is obvious that Wing Cmdr. Bergin has let his judgment and interpretation of the facts be influenced by his moral indignation at the gain which the neurotic may derive from his illness. This gain is a common phenomenon in civilian life also and by no means confined to conditions of military conscription."

"The grossly unsatisfactory state of the treatment of neurosis at the present time arises out of the stubborn and intractable nature of these pathological emotional disturbances. Light-hearted superficialities will not help in the solution of this problem."

A. HARRIS.

"Wing Cmdr. Bergin seems to be passing through one of the phases common to medical officers. Even the kindest M.O. is apt to feel annoyed when he discovers what he fancies is a leg-pull, and he naturally relieves his feelings by a more or less indiscriminate outburst of severity, rationalized in whatever way appeals to him."

"The system of which Wing Cmdr. Bergin complains is not intended to encourage escape, but it does recognize the essential pig-headedness of human nature. At a certain point unwillingness converges to inability, for practical purposes, and it pays better to take what the man will give rather than break him because he will not give you all you want."

W. E. HICK.

"I have been reading with interest Wing Cmdr. Bergin's letter. The cases in which he thinks he had failed in that by their 'unconscious deception' they have got themselves discharged from the Service are in my opinion his most brilliant results, in that the square pegs have found for themselves the square holes for which by temperament and capabilities they are evidently suited . . ."

F. M. E. DAVIES.

"I read Wing Cmdr. K. G. Bergin's letter with great interest. As a neuropsychiatrist working in an E.M.S. hospital for the past five years I have had ample opportunity of assessing the reactions of Service personnel to psychiatric interference. It is a well-known fact that attempting to cure neurosis is an almost hopeless task when the patient is obtaining some advantage in his present environment by being ill.

"However, I would not agree that such individuals 'have, by conscious or unconscious deception, achieved their object'. In my experience actual deception is rare, and in the vast majority of cases the symptoms are truly neurotic—i.e., expressions of disordered emotion over which the sufferer has no control unless given further insight . . ."

J. L. CLEGG.

"I was very interested to read Wing Cmdr. K. G. Bergin's letter, as it raises problems which some of us have been trying to solve for some years past. Let me assure him that the average Service neuropsychiatrist is as cynical as himself, and only too well aware of the fact that his patient may make a rapid recovery just as soon as he is sure of his 'ticket'. But whether it be pandering or no, it is surely good, sound common sense to place 'bad psychiatric bets' in low medical categories . . ."

"In 1942 the Navy opened a special camp to which those who were suspected by psychiatrists of making the most of their symptoms could be drafted. They were under executive command and subject to ordinary Naval

discipline; their symptoms were ignored so far as possible, and no limit was set to their retention in the camp. By such means it was found possible to salve many who would otherwise have required invaliding, but careful placing in various forms of restricted service was necessary in the majority of cases to achieve this result . . .

"Even so, a large number of hysterical and inferior personalities proved resistant and required invaliding."

R. R. PREWER.

"The letter of Wing Cmdr. Bergin contains just that kernel of truth that so often makes so much mischief in generalities. There is none amongst us who has spent the years of war in the Services who has not seen just the case he describes: the man bordering on the anxiety state, a constant burden to his medical officer with his manifold complaints, until finally he is invalidated on psychiatric grounds, often to recover with amazing rapidity as he returns to his more normal environment. Must the psychiatrist and the system be condemned if this man is happily healed and the Service rid of one who can never be other than a liability?

"Wing Cmdr. Bergin, writing no doubt as a medical administrator, treads on dangerous ground if he further inculcates in others the unjust attitude of mind that the Service doctor should think of those who complain of such symptoms as he describes first as scheming 'racketeers' and only secondly as the sick in search of relief. There is no essential difference between the symptoms and the ills of those in the Services and those we treated in days of peace. A few, a very few of each, in both the Services and civilian life, make much of their malady with an end in view; the remainder, the huge majority, have aches and pains for which an organic cause may or may not be found, perhaps depending not a little on the diagnostic acumen and enthusiasm of their doctor, but for which they earnestly and rightly seek help to be rid of. What matters it whether the surgeon or the psychiatrist succeeds? Let us as doctors in the Service remain clinicians primarily, seek for our cures first through the science of medicine, retain the spirit of detached sympathy, and leave the cynicism to others."

G. A. JAMIESON.

"Wing Cmdr. K. G. Bergin should be very careful. He is on dangerous ground. He talks great wisdom when he speaks of 'a system which lays too much stress on psychological illness and not enough on a man's responsibility to his fellows', because lack of this responsibility, or, more positively, the weakness of selfishness, is probably the most common fault of us all, beginning in childhood. But of all systems today modern psychiatry is not the offender to be taken to task. An experienced medical psychologist is very much concerned with responsibility to one's neighbour, for this is the very essence of his definition of sanity . . ."

J. A. McCluskie.

"I am sure that Wing Cmdr. Bergin's eminently sensible and vigorous letter crystallizes the views of many service medical officers who have had to treat 'those unwilling to bear the heat and burden of the day'. As an Army dermatologist I have wasted much time attempting to treat such patients; those whose somatic manifestation of a disturbed psyche takes the form of a rubbed and excoriated dermatosis are known to all dermatologists . . ."

"A few months of military dermatology make one realize that these patients are a liability to the Army Medical Service, and they are eventually written up for a medical board which will invalid them out. While awaiting their board one observes, in the less astute, the transformation to which Wing Cmdr. Bergin draws attention. The hang-dog look disappears, and the traumatized skin heals with amazing rapidity. Should the medical board decide, however, that the patient's disability does not warrant discharge there is an equally rapid relapse. In brief, these patients literally scratch their way out of the Service. Unlike those of their brethren with vague headaches and dyspepsia of nervous origin they have something 'to show', which enables them to preserve their ego; at the same time they possess a most effective lever for escape."

P. HALL-SMITH.

ABSTRACTS FROM CURRENT LITERATURE

Medicine

Observations on the Treatment of Graves' Disease with Thiouracil. Barr, D. P. and Shorr, E.: *Ann. Int. Med.*, 23: 754, 1945.

Report is made of 100 cases of thyrotoxicosis treated with thiouracil. Remission was induced in 87. The drug exerted a beneficial influence on emaciation, tremor, hyperkinesis and circulatory symptoms; on basal metabolic rate, cholesterol levels and the creatine defect and on the tendency of thyrotoxic patients to lose nitrogen, calcium and phosphorus.

Studies of cholesterol levels and the extent of creatine defect were found to be valuable aids in following the effects of the drug. Protrusion of the eyeballs was not lessened but lid spasm and lid lag were improved or controlled.

Benefit from thiouracil was often apparent in less than ten days and normal conditions were usually attained within forty days. Factors tending to retard the rate of response were previous use of iodine and large nodular goitres.

Of the 100 cases, 73 were successful in the sense that they were maintained in remission. In 37 of the 73 the drug was withdrawn for two to 16 and one-half months without relapse. The drug failed to excite a favourable response in two, permitted relapse during treatment in four and exerted unsatisfactory control in two. There were three deaths from circulatory complications but none that could be justly ascribed to the action of the drug.

In twelve cases, unfavourable symptoms resulted in withdrawal of the drug. In five of these there seemed to be little doubt that the untoward symptoms were caused by the drug. Two cases of agranulocytosis were encountered. One was mild and transient; the other was severe and prolonged but recovered after seven days under the protective use of penicillin.

S. R. TOWNSEND

Treatment of Postpneumonic Thoracic Empyema with Sulfonamides, Penicillin and Repeated Thoracentesis. Josey, A. I., et al.: *Ann. Int. Med.*, 23: 800, 1945.

Fourteen cases of postpneumonic thoracic empyema were successfully treated without complications by the use of sulfonamides, penicillin, and multiple thoracentesis. When thoracentesis was done early in the course of the empyema and was frequently repeated the pleural exudate, which was rapidly sterilized, became less purulent and more serious in character and could be completely evacuated.

From these observations the authors feel that this method should be routinely applied in postpneumonic empyema. The previously accepted procedure of allowing the pleural exudate to become thickened and performing a thoracotomy should be applied only when thoracentesis cannot be safely used because of the location of the exudate, or where the infecting organism is resistant to sulfonamide and penicillin.

S. R. TOWNSEND

Prolonged Action of Penicillin in Mixtures of Beeswax and Peanut Oil. Nichols, D. R. and Haunz, E. A.: *Proc. Staff Meet. Mayo Clinic*, 20: 403, 1945.

Calcium penicillin, suspended in 3, 4, 4.8, and 5% mixtures of beeswax in peanut oil according to the method described by Romansky and his associates, has been given by the authors to forty patients. In two of the fourteen cases in which the preparation was given subcutaneously, transient inflammatory reactions developed at the site of injection. Except for slight localized tenderness at the site of injection, no reactions occurred in the 26 cases in which the mixture was administered intramuscularly.

The suspension of penicillin in beeswax-peanut oil mixtures was found to be a practical and effective method of delaying the absorption of penicillin after intramuscular or subcutaneous administration. At least 0.03 of an Oxford unit of penicillin can be maintained in the blood for at least twenty-four hours following a single intramuscular injection of 300,000 units of calcium penicillin in a 4.8% mixture of beeswax in peanut oil.

The absence of any appreciable irritating effects and the convenience of huge concentrated doses which need be given only as a single injection or at relatively long intervals are factors which emphasize the practicability of this method of administration of penicillin.

S. R. TOWNSEND

The Clinical use of Streptomycin. Herrell, W. E. and Nichols, D. R.: *Proc. Staff Meet. Mayo Clinic*, 20: 449, 1945.

The antibiotic agent streptomycin appears to possess therapeutic possibilities which deserve further clinical investigation. No serious irreversible toxic effects have been encountered from its use in 45 patients suffering from a variety of infections by organisms sensitive to its action. Included in this report are 8 cases of bacteraemia, in 6 of which recovery occurred. Doubtful results were obtained in two cases of undulant fever associated with bacteraemia. Good results were obtained in 10 of 13 cases of moderately severe and severe infections of the urinary tract owing to a variety of pathogenic organisms. Of five cases of infection involving the tracheo-bronchial tree, satisfactory results were obtained in four.

Included in the report are four cases of syphilis in which it is doubtful whether treatment with streptomycin was effective although the amount of the streptomycin administered was small. In the group of miscellaneous infections treated with streptomycin are examples of typhoid fever, undulant fever, osteomyelitis, cellulitis, peritonitis, cholangitis, meningitis and ozena. In some infections, the results could be considered satisfactory; however, further clinical trial must be completed before final statements can be made concerning the efficacy of streptomycin in other of these infections.

S. R. TOWNSEND

Primary Tuberculosis in Children Causing Long Illness. Hurford, J. V.: *The Lancet*, 246: 624, 1945.

The greatest danger to a child from first infection with the tubercle bacillus lies within the early months. Ustvedt says tuberculous meningitis develops within 3 months of infection, most pleuritis within 6 months and only 50% of bone and joint disease within the 1st year. This last fact indicates that infection lingers for a long time in the primary complex.

The common course of primary tuberculosis of the chest in a child is for the illness to begin with short fever and transient symptoms, e.g., cough, loss of weight, erythema nodosum. Radiography shows enlarged hilar gland and sometimes a primary focus. The child's progress is usually uninterrupted on treatment and he is considered fit to leave hospital in 6 or 9 months. At this time there is no clinical activity and the x-ray shows the glands smaller and harder. Calcification may be showing but often takes 6 to 24 months to become apparent. The picture of primary tuberculosis in the child looks like a fairly benign affair because the child appears well. However those who are not well make up the 36% of cases who remain in hospital for a year or more.

The reasons for this are: (a) persistence of a complication present on admission or developing shortly afterwards; (b) non-resolution of massive primary complex or large glands; (c) development of fresh complications after admission. They will show one or more of the following signs of illness. (1) General condition —child remains pale and does not gain weight. (2) Temperature and fever elevated. (3) Sedimentation rate remains above normal. (4) Secondary infection,

an exanthem often exacerbates the condition. (5) Radiograms—little change or increased size of hilar glands. (6) Complications—atelectasis, pleural effusion, haemogenous spread of tuberculosis. (7) Gastric lavage—few cases give positive result even at late stage of treatment.

Case records of several patients are presented to illustrate the main points of the article. Emphasis is laid on the occurrence of long illness in a proportion of children who become infected with tuberculosis, an illness which requires careful observation and treatment on sanatorium lines.

L. M. SPRATT

Therapeutic Measures in Rheumatic Fever. Gubner, R. and Szucs, M.: *New England J. Med.*, **233**: 652, 1945.

In order to evaluate the efficacy of various agents in the treatment of acute rheumatic fever a comparative therapeutic study was carried out in 150 cases of young men of average age of 23 years. The types of therapy employed consisted of the following: sodium salicylate combined with sodium bicarbonate (4.0 to 6.7 grams of each daily) 37 cases; sodium salicylate with ascorbic acid (200 mgm. daily) 32 cases; calcium double salt of benzoic acid and succinic acid benzyl ester (4.0 to 5.3 grams daily) with ascorbic acid 55 cases; sulfathiazole (6 grams daily) 15 cases; penicillin (50,000 units daily) 5 cases and sodium bicarbonate alone (4.0 grams) in ten cases.

No demonstrable effect was evident from the use of sulfathiazole, penicillin or sodium bicarbonate by itself. The only difference noted in the groups treated with salicylates was a striking diminution in salicylate toxicity with the addition of the ascorbic acid.

Comparison of the 65 salicylate-treated cases with the 55 receiving the succinate and ascorbic acid, demonstrated that the latter group responded definitely more favourably as regards duration of fever, leukocytosis, elevation of sedimentation rate and length of hospital stay. Signs of carditis developed in 69% of the salicylate-treated cases but in only 19% of those treated with succinate. No relapse took place in the latter group while seven of the salicylate group relapsed. Evidence of drug toxicity was noted in only one of the succinate group as compared with 19% of those treated with salicylate.

Succinic acid is a catalyst in biological oxidation and its beneficial effect in the treatment of rheumatic fever probably results from its ability to neutralize the widespread interference with various constituents involved in tissue oxidation. Combination with calcium enhances this effect as does the addition of ascorbic acid.

NORMAN S. SKINNER

Death Following the Intravenous Administration of Papaverine Hydrochloride. Sagall, E. L. and Dorfman, A.: *New England J. Med.*, **233**: 590, 1945.

The intravenous use of papaverine hydrochloride has been advocated in the treatment of a variety of conditions and, although reactions have been recorded, it is generally believed that there is no contraindication to its use. The authors record in detail two cases of rapid death following its use. Both were cases of arteriosclerotic heart disease, one with an embolus at the bifurcation of the aorta and the other with a pulmonary embolus. Death followed within one minute of completion of the injection in the first case and within five minutes in the second. It is concluded that intravenous papaverine hydrochloride is capable of causing death.

NORMAN S. SKINNER

Surgery

Chronic Ulcerative Colitis with Generalized Peritonitis and Recovery. Treatment with Penicillin and Sulfadiazine. Palmer, W. L. and Picketts, W. A.: *Arch. Surg.*, **51**: 103, 1945.

Perforation of the colon seldom is a complication of ulcerative colitis. The perforation of the colon with generalized peritonitis has hitherto been a fatal

occurrence. Chronic perforation with abscess formation, on the other hand, is not infrequently followed by recovery. The authors report the case records of three patients with what was considered to be perforation of the colon with generalized peritonitis and in one instance, subsequent drainage of localized collections of pus. Their recovery was attributed primarily to therapy with sulfonamide compounds and penicillin, although blood transfusions and other supportive vaccines were used.

In one patient, two large abscesses were subsequently drained surgically. In another patient laparotomy, three weeks later, disclosed the loops of bowel bound together by the recent adhesions characteristic of peritonitis. In the third patient, the clinical picture was typical of peritonitis, but no operation was performed. In general the sulfonamide compounds tend to inhibit the growth of the Gram-negative organisms in the bowel and penicillin that of the Gram-positive ones. The possibility of a synergistic action of the two drugs also exists.

G. E. LEARMONT

Radical Resections of Advanced Intra-abdominal Cancer. "Résections radicales du cancer intra-abdominal avancé". Brunschwig, A.: *Ann. Surg.*, **122**: 923, 1945.

Les améliorations apportées à la préparation des patients devant subir une intervention radicale dans les cas de cancer intra-abdominal reconnu avancé ont eu pour effet de réduire la mortalité postopératoire et de permettre aux chirurgiens des résections plus audacieuses qu'auparavant.

L'auteur présente 100 cas au milieu desquels il a choisi 4 cas types dont la description lui fournit l'occasion de dégager certaines considérations. Voici les contre-indications d'une extension radicale de l'acte opératoire dans les cas de cancer abdominal avancé: métastases péritonéales étendues; trop nombreuses métastases hépatiques; impossibilité de circonscrire les masses néoplasiques par les incisions de la résection. Toutefois, lorsqu'un soulagement immédiat s'impose, même s'il est avéré qu'il ne doit être que temporaire, on peut passer outre aux contre-indications mentionnées plus haut. L'auteur cite plusieurs cas où il s'en est bien trouvé, chaque patient ne présentant pas deux formes de cancer identiques et réagissant différemment au développement du cancer comme à l'opération elle-même.

Les opérations pratiquées varient de la gastrectomie subtotale à la pancréato-duodénectomie en un temps, de la gastro-jéjunostomie (procédé de Polya) à la duodéno-jéjunostomie, en passant par toutes les résections organiques massives commandées par la diffusion néoplasique locale.

PIERRE SMITH

Vagotomy for Gastroduodenal Ulcer. "Vagotomie pour ulcère gastro-duodénal". Dragstedt, L. R.: *Ann. Surg.*, **122**: 973, 1945.

L'auteur estime que le fait le plus anormal à constater quant aux sécrétions déterminant un ulcère gastro-duodénal réside moins dans l'indice excessif d'acidité les sécrétions gastriques ou dans l'excès même de cette production que dans l'intensité de sécrétions du suc gastrique entre les repas ou la nuit, quand l'estomac est vide et sans stimulant contraire.

A la suite de différents tests, il suggère que l'on peut établir une relation et même une filiation entre l'hypersécrétion du suc gastrique chez les patients atteints d'ulcère et leurs réactions neurogéniques. Ce qui l'a amené à pratiquer chez 39 patients une vagotomie dans le but de réduire l'excès des sécrétions gastriques.

L'auteur décrit sa technique opératoire: vagotomie supradiaphragmatique dans le plus grand nombre de cas, sous-d'aphrégmatique dans quelques uns, associée ou non à une gastro entérostomie; il indique d'une façon très précise comment doivent être traités et dissociés les nerfs du vague. Un test à l'insuline permet de vérifier si toutes les filets principaux du vague ont été section-

nés. L'auteur a pratiqué et recommande le lever précoce après 24 heures afin de diminuer les possibilités d'atélectasie et de broncho-pneumonie.

Trente des patients traités par vagotomie avaient un ulcère duodénal, deux un ulcère gastrique et sept un ulcère gastro-jéjunal. Un examen postopératoire attentif a permis de constater une amélioration persistante de l'ulcère, une augmentation de poids et une constatation radiologique de la cicatrisation des lésions. Si le tonus et la mobilité de l'estomac ont été amoindris par l'opération ils n'ont tout de même pas été abolis. La section des nerfs vagaux n'a pas d'effet sur la réaction sécrétrice de l'estomac à l'histamine ou à la caféine mais abolit cette réaction à l'hypoglycémie insulinienne et à un faible repas.

PIERRE SMITH

Les déformations pseudo-néoplasiques de l'antral dans l'ulcère de la petite courbure. Gutman, R. A.: *La Presse Médicale*, 47: 636, 1945.

L'auteur étudie une déformation qui diffère de l'ulcère classique de la petite courbure. L'ulcère qu'il décrit se manifeste à distance par une influence nerveuse qui change globalement la forme de l'antral et en modifie même le relief muqueux, soit par gastrite, soit par une désorientation autoplastique des plis.

Le diagnostic précis de cet ulcère ne peut être fait que par l'examen minutieux de plusieurs séries de clichés. Ces images si peu connues sont, dans l'ulcère de la petite courbure, d'une extrême fréquence. Elles font vraiment partie de sa physionomie et permettent même de soupçonner plus haut un ulcère causal. La confusion, si commune et si grave, avec le cancer devrait être moins fréquente si, dans l'examen des clichés, on se rappelait que le caractère essentiel des grandes images néoplasiques est d'être "superposables", ce que l'on ne retrouve pas dans le cas dont il est question.

L'auteur signale toutefois une autre difficulté de diagnostic à laquelle on peut se heurter. "On peut observer, en effet, vraiment, des lésions doubles, ulcère gastrique et prépylorique, association qui ne change pas grand' chose à la conduite thérapeutique, mais surtout ulcère de la petite courbure et cancer authentique de l'antral. L'image pathologique, dans ce cas, reste constante sur la série et stable ou progressive sur les séries ultérieures."

Les chirurgiens gastro-entérologues apprécieront ce souci de contrôle radiologique élaboré qui établira plus solidement l'opportunité de leur intervention.

PIERRE SMITH

Plastic Surgery and Burns

Cutis Grafts. Harkins, H. N.: *Ann. Surg.*, 122: 996, 1945.

Cutis grafts have been used since 1913 to fill in tissue defects, and in the operative treatment of hernia. Cutis is formed of the deeper layers of the skin from which the epidermal layers have been removed. It contains sebaceous and sudoriferous glands, occasional hair follicles, and some subdermal fat.

The cutis graft may be obtained by (1) removing the epidermis with a dermatome and removing the cutis with a scalpel; (2) cutting a full thickness graft (0.40 to 0.50 inches), leaving one end attached, then removing the epidermis with a dermatome, cutting from the attached end (Scola); and (3) cutting a full thickness graft with the dermatome, resetting the blade, and removing the cutis leaving the epidermis attached to the drum — (the split-split method of Zintel). The donor area is covered with the epidermis.

Nine ventral and 2 epigastric herniae were repaired by silk closure reinforced by an overlying patch of cutis sutured under tension. Five had had previous attempts at repair. Cutis grafts were obtained from the thigh in 10 cases and from the abdomen (discarded lipectomy) in 1 case. In 6 cases the cutis was cultured, with negative results in 4 instances. Ten of the eleven patients showed no recurrence in from 1 to 22 months (average 8).

Objections to the use of the cutis grafts are (1) introduction of infection; (2) persistence of epithelial elements with resultant cyst formation; (3) bridging a fascial defect is seldom necessary in the repair of herniae, and (4) reinforcement is not necessary in small herniae and increases operating time too much in large herniae. Clinical experience indicates that infection is an infrequent complication. Experimental work shows that cyst formation may occur. The author has never seen a ventral hernia where the fascial layers could not be brought together. Use of the split-split method of obtaining a cutis graft, plus two operating teams removes the fourth objection.

Cutis grafts were implanted in 25 experiments on 14 dogs. Of 13 grafts placed in the abdominal wall only 6 were without complication (pus, hair, sebaceous material, disappearance of graft). In 5 bridging of abdominal wall implants gross examination showed complete absence of hair, pus, cysts, etc. Three were adherent on both surfaces, and one on the epidermal surface only. Histological examination showed hair in four instances. Two common iliacs were ligated with cutis grafts. In one, the graft had disappeared; in the other, the artery was occluded but a mass of sebaceous material was present. Two aortic ligations were done and in neither case was the aorta occluded. One graft had disappeared, the other replaced by a mass of sebaceous material. Of three diaphragmatic defects repaired by cutis grafts, no evidence of abnormal healing was found. All examinations were done at necropsy.

The author concludes (1) that the superficial removal of the epidermis need be no more than 0.008 inch; (2) a relatively non-hairy donor site is desirable; (3) with adequate skin preparation infection does not seem to be a major menace; (4) the split-split method is the most useful technique for obtaining cutis grafts; (5) it seems to make little difference whether the cutis is used epidermal side up or down, and as a double or single sheet; (6) cutis grafts should be applied under tension, and should be used as a supporting patch; and (7) cutis grafts as used experimentally are not suitable for ligation of major arteries.

STUART GORDON

Principles in Early Reconstructive Surgery of Severe Thermal Burns of the Hands. Smith, B., Cornell, C. and Neill, C. L.: *33: 145, 1945.*

War burns characteristically involve the lips, nose, upper face, eyelids, brows, forehead, ears, dorsum of hands and encircle the wrists. Transportation of the burn casualty to a hospital equipped for definitive treatment should be accomplished immediately. Meticulous care should be taken to prevent infection. Attendants and patients should be capped and masked when the burns are exposed. Dressings should not be done shortly after the ward floors are swept.

Usually the general condition of the patient demands immobilization of the hands for the first three days. Pressure dressings should not be too tight. Hands should be elevated above the level of the heart, the ideal position of the hand being mid-flexion of its fingers and 45° extension of the wrists. Elevation is continued after exercises have been started.

Active motion in a saline bath is started on the third day. Exercises are directed by a physiotherapist and are carried out during three half-hour periods daily. At one of these periods the entire dressing is floated off. Digits are bandaged independently. The commonest result of delayed early motion is an extension deformity of the hand. It is difficult to determine the depth of a burn until the slough is excised under pentothal anaesthesia. Forceful manipulation of the digits should not be done. Saline dressings prepare the wound for grafting in 24 to 48 hours. Organization and fibrosis are the result of persistent oedema and may occur at 12 days. Surgical epithelialization is the only means of arresting scar tissue formation. Early grafting, regardless of bacteria present, is imperative.

Inhalation anaesthesia is preferable. If the burns are about the head endotracheal anaesthesia is most suitable.

Grafts will grow as early as the 11th day following destruction of the dermis by burning. Under tourniquet the thin new epithelium and the granulations are excised with a sharp knife until a smooth firm base is obtained. Best technical and cosmetic qualities are obtained by using grafts on the dorsum of the hand 1/100" thick. If skin has to be cut from the chest wall the inter-rib depressions may be elevated by the subcutaneous injection of saline. Usually a drum and a half of skin will cover the dorsum of hand, fingers and thumb. The graft should not be sponged or washed, but placed directly on the recipient bed. It should be stretched uniformly and tightly over the defect. Fixation is by interrupted sutures. The dressing of the applied graft should not be adherent. Xeroform gauze or sulfanilamide crystals minimizes sticking of the cement on the graft surface. Pressure dressing is applied with the wrist cocked up and the fingers flexed. After 24 hours, continuous saturation of the dressing with saline is done. The donor area usually heals in about 10 days.

Postoperative splinting and elevation last 5 days. Dressings are then washed away in a saline bath. Cocoa butter is applied to the surface of the graft. No further dressings are done except for a well-padded loose protective dressing at night. Submersion bath and exercises, 3 times a day, are resumed. Unless the patient is specifically instructed, he tends to move the metacarpo-phalangeal joints only.

Deformity and disability of the hands following thermal burns may be reduced by such early management.

STUART GORDON

Obstetrics and Gynaecology

Erythroblastosis Fetalis and Accidental Antepartum Haemorrhage. Burch, A. E.: *J. Obst. & Gyn. Brit. Emp.*, 53: 463, 1945.

The following facts emerge from the St. Alfege's series of cases. Five of 10 (50%) of the mothers who had an accidental antepartum haemorrhage were Rh negative with Rh positive husbands and 3 of these had anti-Rh agglutinins. Of the 3 who were delivered soon after the antepartum haemorrhage, 1 had a child with only a moderate degree of jaundice, who recovered without transfusion, another a child with very gross hydrops, and the 3rd a child stillborn, possibly as a result of the course of labour. In the 2 mothers who were not delivered until some weeks after the first haemorrhage, the fetus was stillborn, macerated, and of a size corresponding roughly with death at the time of onset of the bleeding. Of the cases with Rh positive mothers, in only 2 were the Rh genotypes determined; the mothers were found to be Rh₁Rh₂ and Rh₁Rh₂, with children Rh₁Rh₂ in each case. This could theoretically make possible the development of the less common *I* and *H* antibodies in the 2 mothers, but evidence of their presence was not found. It is too early to dogmatize, but it would seem justifiable to conclude that the woman in whom iso-immunization can occur, is abnormally prone to accidental antepartum haemorrhage, and the ensuing placental damage may be a factor in transmission of antigen and agglutinin. There seems except in one case, to be an association between the time of delivery and bleeding and the severity of the erythroblastosis and titre of the agglutinins. P. J. KEARNS

The Behaviour of the Fetus in Utero. Vartan, C. K.: *J. Obst. & Gyn. Brit. Emp.*, 52: 417, 1945.

The clinical work upon which this paper is based was done at the British Hospital for Mothers and Babies at Woolwich. Breech presentation in pregnancy is so common that at the appropriate stage it is normal. It is the persistence beyond this stage that constitutes the abnormality. In 60% of cases spontaneous version will take place. Once it has taken

place reversion only very seldom will take place. Version is shown to be most often completed by the 32nd week. External version as a therapeutic measure is therefore indicated for the breech persisting after the 32nd week. Failed version usually means little liquor and an extended attitude. These two factors stand out as the real etiological factors of breech presentation at term. Multiparity and prematurity are also factors. Of the 38 persistent failed versions, 4 were medically induced, and 11 surgically by the rupture of the membranes. One Cæsarean section was performed. In the remaining 22 the size of the fetus, and the capacity of the pelvis were correctly judged to allow of a good prognosis being given and no interference was necessary. P. J. KEARNS

Morphological Study on Chorioepithelial Proliferations.

Laqueur, W. A.: *J. Obst. & Gyn. Brit. Emp.*, 52: 468, 1945.

Isolated chorionic cells *per se* are but an indication of a state of pregnancy either present or past. When large numbers of invading cells are found this usually points to some previous abnormality of the uterus, such as myoma, adenomyosis, or old lesions—particularly when found a long time after pregnancy—and not to increased, independent activity of trophoblastic derivatives. It always remains with the pathologist, by all means at his disposal, to establish a relation between chorionic invasion and pregnancy. The wide range, variations and distribution of cell proliferation and infiltration have been abundantly demonstrated in the above cases. There has been an attempt to explain that the presence of chorionic cell proliferations in the last month of pregnancy, after a full time delivery, or after an expulsion or removal of a hydatidiform mole supports the diagnosis of malignant chorionepithelioma. When similar histological pictures are present in a still existing mole or early pregnancy then one needs to be most cautious in making the diagnosis of malignancy. In the same way vaginal metastases are not necessarily malignant. When villous stroma is found in these then one is of the opinion that the condition is innocent. P. J. KEARNS

Body Temperature in Menstrual Disorders. Nieburgs, H. E.: *J. Obst. & Gyn. Brit. Emp.*, 52: 435, 1945.

The vaginal and oral, or both temperatures taken simultaneously, were investigated in 41 women over 150 cycles. The normal cycle shows a clear differentiation of its various phases, including ovulation. In amenorrhoea, oligomenorrhœa, menorrhagia, dysmenorrhœa and intermenstrual bleeding, the temperature curves are of great diagnostic value. Special significance is attributed to the changing relation of oral and vaginal temperature in dysmenorrhœa. In the therapy of menstrual disorders the temperature curve aids in deciding on the hormone and dosage to be administered, and indicates its degree of effectiveness. The unmistakable sign of ovulation is of importance in cases of subfertility as well as for birth control owing to the easily recognizable safe and unsafe periods. No objections have been encountered from patients who were asked to take their vaginal or oral temperature, or both simultaneously for many cycles. Intermenstrual bleeding occurs with a very slight temperature rise of usually 0.2° F. only. (Estrogen lowers temperature. P. J. KEARNS

Effect of Postoperative Exercises and Massage on the Incidence of Pulmonary Embolism. Erskine, J. P.: *J. Obst. & Gyn. Brit. Emp.*, 52: 480, 1945.

It has been shown that there is a fall in the platelet count after operation followed by a sharp rise beginning on the 7th day and reaching a maximum about the 10th day. Robertson found that the coagulation time was shortened and the sedimentation rate increased. Infection may play a part, and we have shown that in 78% of our fatal cases some

elevation of temperature was present during the 3 days preceding the embolism. As both Robertson and Bonney have pointed out, frank thrombophlebitis rarely precedes pulmonary embolism since the clot then is so adherent to the inflamed vessel wall that it cannot readily break loose. The infection is therefore probably of a mild type. Most authorities are agreed that one of the principal contributory factor is venous stasis. This results from the relatively immobile position of the patient in bed, from obstruction such as that produced by the knee pillow and from diminished respiratory excursion. The venous return to the heart is dependent largely on the negative pressure in the thorax during inspiration and, at the same time, on the increased abdominal pressure resulting from descent of the diaphragm. In the limbs contraction of the muscles encourages movement of the blood in the veins. Forty-three and one-half per cent of the cases of fatal embolism occurred in the 1st week. We agree with Snell who says that it is probable that there is a group of patients over 50 years of age, obese and with a normal or subnormal blood-pressure, who are particularly susceptible to pulmonary embolism as a postoperative complication.

P. J. KEARNS

Acute Hydramnios. O'Driscoll, D. T.: *J. Obst. & Gyn. Brit. Emp.*, 52: 496, 1945.

The symptoms of a distension of a hollow organ will predominate rather than those of pressure; the latter will develop subsequently. Pain is the most outstanding feature. In the very early stages, the patient usually complains of an uncomfortable sensation of tightening across the abdomen; this very rapidly gives place to a very severe abdominal pain, radiating over the whole abdomen, over the sacrum, and often down the thighs. Vomiting becomes severe and persistent, often producing thirst from loss of fluid.

In the true acute variety, the signs are not those of great accumulation of fluid, but rather those of abdominal and uterine muscle spasm. The abdomen is tense, tender, and difficult to palpate; fetal parts are usually impossible to feel owing to muscle spasm, abdominal tenderness and, to a lesser degree, presence of excess liquor. The fetal heart sounds are often not heard.

P. J. KEARNS

The Pathogenesis of Postsalpingectomy Endometriosis in Laparotomy Scars. Sampson, J. A.: *Am. J. Obst. & Gyn.*, 50: 597, 1945.

Frequently, a preliminary uterine curettage is done prior to a salpingectomy or tubal sterilization. During the manipulation of the uterus incident to the salpingectomy, blood carrying bits of the uterine mucosa may escape through the uterine end of the severed tube and may be transplanted not only in the uterine cornu, but even in the peritoneal cavity or in the abdominal wound.

In 15 patients presenting scar endometriosis the entire uterus together with the portion of the laparotomy scar was removed intact. In 12 the uterine cavity was injected through the cervix with 15% melted gelatine coloured with lamp black. The remainder were not injected. Sections from many levels were always studied. In 8 of the 12 specimens in which gelatine had been injected into the uterine cavity, gelatine was found in the lumina of some of the tubules and other ectopic Müllerian cavities of the scar endometriosis and also in the endometriosis about the end of the tubal stump. In all of the eight specimens the scar endometriosis arose from the invasion of the abdominal wall by the mucosa of the tubal stump.

Ectopic mucosa which can be shown to have had its origin in the mucosa of a tubal stump and to have grown from it by continuous invasion, may not only retain the structure of the tubal mucosa, thus being actually an endosalpingiosis, but may also assume both

the structure and function of the uterine mucosa; including its reaction to menstruation and pregnancy, thus producing true endometriosis.

The most fascinating observation made in this study of postsalpingectomy scar endometriosis is the ease with which the gelatine, at times, flowed through the lumina of tubules and glands, as though they were lymph vessels. In some specimens of scar endometriosis, tubules play the more prominent rôle and in others, glands; they are the leaders and life of the invasion. A tubule is a Müllerian gland without appreciable stroma about it, and a gland is a Müllerian tubule clothed in stroma. Otherwise, Müllerian tubules and glands are essentially one and the same as far as the pathogenesis of postsalpingectomy endometriosis is concerned.

ROSS MITCHELL

Ectopic Gestation. The Diagnostic Value of Cul-de-sac Aspiration. Burch, L. E. and Seitchik, J.: *Am. J. Obst. & Gyn.*, 50: 765, 1945.

After reviewing the signs and symptoms of ectopic gestation and the differential diagnosis, the authors emphasize the value of aspiration of the peritoneum either *per vaginam* or through the abdominal wall if conditions in the cul-de-sac make it not advisable to aspirate *per vaginam*. It is not time-consuming and can be used in any hospital or even in the private home. If the aspirated blood shows an absence of rouleaux formation and the erythrocytes show a crenated appearance, it signifies a hemorrhage into the peritoneal cavity. In obtaining blood from the peritoneal cavity attention is paid to colour, viscosity, presence of small clots and clotting time. The old blood has a definite brownish tint. It is thinner than fresh blood and does not clot. A size 17 needle is used which is large enough to permit the aspiration of small clots.

ROSS MITCHELL

Pathology and Experimental Medicine

Structure of the Liver in Pellagra. Gillman, J. and Gillman, T.: *Arch. Path.*, 40: 239, 1945.

Using a liver biopsy technique, Gillman and Gillman have studied the pathology of the liver of 120 South African pellagrins. The biopsies were taken on the first day of hospital admission and the information so obtained was supplemented by further biopsies during the course of the disease. In all, some 600 biopsies were studied.

It was found possible to divide the pathologic changes into four groups. The first group comprised varying degrees of fatty change; the second showed cytosiderin (haemosiderin) and cytolipochrome (haemofuscin) in discrete granules in the hepatic and Kupffer cells; the third group showed an aggregation of the iron-containing pigment in large masses in cells lying in the hepatic lobule or in the portal tracts; the fourth group was characterized by pigmentary cirrhosis. All groups were subject to the varying degrees of fatty change found in group one.

The fatty type of liver was found in pellagrins infants and children, while the pigmented liver occurred in adolescents and adults. Pigmentary cirrhosis was found in 12.5% of all pellagrins and in 15% of the pellagrins adults, occurring chiefly under 40 years of age. The cirrhosis was indistinguishable from that of haemochromatosis.

The authors conclude that malnutrition causes severe liver damage, including pigmentary cirrhosis, and they refute the theory that this type of cirrhosis is the result of some inborn error of metabolism. They point out further, that every pellagrin shows a different degree of liver damage, and that the hepatic lesion may progress silently after the overt manifestations of the pellagra have been cured. They suggest therefore, that liver biopsy should be used as a guide to proper therapy.

G. C. McMillan

Hygiene and Public Health

San Francisco Industrial Venereal Disease Education and Casefinding Program. Koch, R. A., Arnstein, L. and Painter, A. C.: *J. Venereal Dis. In.*, 27: 9, 1946.

As a result of the co-operative action of labour and management, successful venereal disease education and casefinding programs were developed in a number of industrial plants through the co-operation of the San Francisco Department of Public Health.

The program was divided into 3 phases: first, to gain the confidence of the labour unions in the objectives of the health department; second, to direct the confidence, once gained, into positive labour union action by introducing premembership serological examination; third, to develop the program at an industrial level where the facilities of management could be used, with the health department acting as the intermediary in effecting the industrial health program.

In the initial phase of the program approximately 200 lectures were given to the various labour unions, 200,000 special health bulletins were distributed to members, and 8,000 members were given serological examinations. Tabulation of the serological survey showed that 336 positive blood reactions were discovered; 133 (40%) were examined in health department clinics; 71.5% of the patients had been ignorant of infection. Because all medical information received by the health department was kept confidential, confidence of the labour unions was established. This led to approval of the program by the Executive Board of the California State Federation of Labour and the various labour councils, which urged the passage of resolutions requesting member locals to blood test all new members. Resolutions were passed by all of the main American Federation of Labour Councils.

Consequently, serological surveys were undertaken in labour union halls and an educational program was instituted.

As a result of the educational programs and serological surveys, the authors conclude that management has been made to recognize that the syphilis patient under treatment is non-infectious and is an industrial hazard only in the case of cardiovascular syphilis or neurosyphilis. Management has been encouraged to discontinue the policy of discharging those employees known to have syphilis, and to accept the health department as the one to determine in what capacity such persons should be employed.

Regarding the Unusual Effect of Penicillin Therapy Upon the Uterus. Speiser, M. D. and Thomas, E. W.: *J. Venereal Dis. In.*, 27: 9, 1946.

Upon reviewing the records of 156 prenatal patients and investigating 1,400 nonpregnant women treated with penicillin, the authors found no evidence that penicillin therapy produced contractions of the uterus or uterine bleeding.

Among the 156 prenatal patients were 5 patients who showed some aberration from the usual course at a variable period of time after treatment; in only one patient was there any question regarding the possible effects of penicillin treatment upon the pregnant uterus and here it was highly doubtful.

On the premise that no known single drug without an endocrine effect is capable of producing uterine contractions as well as causing intermenstrual bleeding, the authors investigated the episodes of uterine bleeding occurring in nonpregnant women while under penicillin therapy. Penicillin therapy was given to over 1,300 women without any menstrual abnormality being noted which could be attributed to the effects of such therapy. Also, 100 patients under penicillin treatment for early syphilis were accurately studied, and in only one instance was any alteration from the usual cycle found. In this patient bleeding recurred 6 days after a previous normal period.

The authors conclude that in the few reported cases of both abortions and intermenstrual bleeding in association with penicillin therapy, some associated pathological process may have accounted for such episodes, namely an associated cervical erosion, endometritis, salpingitis, ovarian cysts, or uterine neoplasms.

Industrial Medicine

Trial by Ordeal—from a Neuropsychiatrist's Viewpoint. Howe, H. S.: *Indust. Med.*, 14: 702, 1945.

In this article, which records a talk given some months before the end of the war, the author discusses the problems which can be expected to arise during the reintegration of American returning men. In his opinion they are problems which must be met individually, rather than by legislation or other mass measures. He considers them as they are met with among three groups of veterans: the normal group; those with personality alterations severe enough to require hospitalization; and those with physical handicaps.

The principal desire of veterans in the normal group is suitable employment with adequate remuneration. Reference is made to the American Veterans Committee which has been organized to promote the objectives and to safeguard the rights of these men, and to the necessity for very careful consideration of all legislation conceived as veterans' aid. These men must be integrated into employment, not as a separate class or as specially privileged individuals but as an indispensable part of the organization. It is important too, that when employed they should be encouraged to consult the employment personnel officer when they need help on any problem.

Considerable differences will be noticed in the personalities, as well as in the mental and emotional conditions of the veterans. In many there will be noted an attitude of hostility, a feeling of resentment towards those at home and towards the way of life they find upon returning. The responsibility for their readjustment will fall largely upon the women of the country. The readjustment of family relationships also will require assistance. Veterans with psychoses and severe psychoneuroses will be hospitalized in military establishments. It has been shown that many individuals with severe psychoneuroses induced by war, recover rapidly when the patient is removed from the scene of action.

Excellent centres have been maintained by the War Department for the rehabilitation of veterans with physical handicaps. Measures are adapted to strengthen atrophied muscles, to free stiffened joints and to restore function by therapeutic exercise and each individual is made to realize that he is going to be a normal useful member of society. It has been found that of the men cared for in these centres, 80 to 90% have been returned to active service or enabled to find employment.

In referring to the hesitation of some personnel managers to employ men discharged from training centres for neuropsychiatric reasons, the author cites the experience of the New York Induction Centre, where it was found that the greater proportion of the men found unacceptable for the Armed Services, for neurological or psychiatric reasons, could be normally employed.

MARGARET H. WILTON

Added Infection in Industrial Wounds. Clayton-Cooper, B. and Williams, R. E. O.: *Brit. J. Indust. Med.*, 2: 146, 1945.

The necessity for aseptic methods in handling even the small wounds that constitute the majority of those treated in the surgeries of engineering factories, is clearly indicated by the results of the investigation reported in this article. Association between methods of wound dressing and the incidence of cross-infection had been demonstrated in hospitals, and, in view of the known prevalence of sepsis in industrial wounds it was

considered important to know the conditions existing in factory surgeries.

A preliminary survey was made to determine the gross infection rates. This was carried out in 19 factories of different sizes and with varying first-aid facilities. Of 531 small wounds and septic lesions examined in the surgeries, 48% were infected with pyogenic cocci. About half the infected wounds were septic; the rest were silently infected. In general, the infection rate increased with the age of the wound. This preliminary survey established the fact that wounds treated in factory surgeries are infected with the same bacterial species as the larger wounds previously studied in hospital, and suggested that infection was being introduced into wounds during healing.

To determine the influence of the dressing technique on the incidence of infection, a detailed survey was made in two factories engaged in similar work but where different dressing routines were followed. A detailed comparison of 472 wounds showed that the infection rate among wounds treated with the more aseptic technique was significantly lower than in those in which the less rigorous technique was employed. In the surgery with the higher rate, the wounds were handled more freely and the deficiencies in dressing routine were such that would facilitate the spread of pyogenic microbes from one patient to another.

After taking into consideration their own experience in studying cross-infection in hospitals together with that of other workers, the authors believe that the difference in aseptic methods used in the two factories investigated had a definite influence on the difference observed in the infection rates. They recommend the adoption of a simple but rigorous routine of dressing.

MARGARET H. WILTON

I can of him as an operator, for I gave anaesthetics for him during many years: in France in 1915 when we were fellow officers of No. 3 Canadian General Hospital, and during nineteen years when I was on the staff of the Royal Victoria Hospital. He was a dexterous, bold but careful operator. Few surgeons I have worked with, and I have worked with many, showed up as well as Archibald in an emergency at the operating table. I never saw him even the slightest bit flustered by a haemorrhage.

Archibald concerned himself about as little with the main chance as it is possible for a successful man to do. He was a man of the world but nevertheless unworldly. He was ambitious in the best sense. He wanted to make the most of the gifts with which nature had endowed him and he was content to be judged by the quality of his work. The recovery or relief of his patient, rich or poor, was his sole concern while he was with him or her; everything else was forgotten. One morning when I was leaving my flat to go to the Royal Victoria Hospital to give anaesthetics to two of his private patients I was suddenly attacked with renal colic. I managed to telephone and explain the situation to Archibald. He was to begin operating at nine o'clock. In a few minutes he was with me. Forgotten were his private patients. It was nearly eleven before he left me.

The study and practice of modern surgery demands so much of a man's attention that as a rule he has little time for interests outside his work. He is, therefore, often a dull companion in mixed company because he has nothing to talk about except shop, golf and trivialities. Archibald played golf and played it well but he never talked about it. He was widely read and widely interested. He was not only an interesting talker but he was that rarity, a good listener. If his interest flagged, his manners were much too good for anyone to suspect it. Occasionally people presumed on his gentleness and got a taste of a sarcastic wit that few knew he possessed and no one risked being the butt a second time. His deafness and his incurable habit of being late were serious handicaps, but he had compensations given to few men. It is given to very few to inspire as much respect and affection as he did. He had a keen sense of humour; he was completely free from snobbery; he was generous to a fault. McGill University and the Royal Victoria Hospital lost a representative they could ill afford to lose when he reached the age limit and had to retire. His friends mourn the death of a great gentleman.

WILLIAM BOYMAN HOWELL

Dr. Henri Bécotte est décédé, à sa résidence de Montréal, à la suite d'une longue maladie, à l'âge de 59 ans.

Il fit ses études classiques au Séminaire de Nicolet, et ensuite étudia la médecine à l'Université de Montréal, où il fut licencié en 1912. En 1918 il s'enrôla dans l'armée canadienne, pour faire du service en France, en Angleterre et au Canada, où il servit jusqu'en 1920, comme membre Médicaux au Service des Pensions. Il exerça sa profession à Arthabaska jusqu'en 1943.

Lui survivent, son épouse, sa fille Françoise, et une fille adoptive.

Dr. Arthur McKnight Bell, died at the Ste. Anne Military Hospital on February 3.

Dr. Bell served in the Great War with the Royal Army Medical Corps in Mesopotamia, Greece and France and on return from overseas was with the Immigration Department in Quebec. He joined the staff of the Laurentian Sanitorium at Ste. Agathe, Que., in September 1928 and retired in April, 1943, due to ill health.

Dr. Bell was born at Merrickville, Ont., in 1879 and was a graduate of the University of Toronto.

Dr. Henry W. Benson, of Port Hope, Ont., died January 9, in St. Michael's Hospital, Toronto. He was 59 years of age.

OBITUARIES

[We are glad to publish the following additional memoir of Dr. E. W. Archibald, from one of his oldest and most intimate friends, Dr. W. B. Howell, who now lives in England.]

I first met Archibald in 1892, the year we began our medical education. I did not know him well when we were students though we played cricket together in the summers, and once when bowling to him at the practice nets I had the satisfaction of breaking his middle stump. Our friendship began in the early days of the Children's Memorial Hospital. Mackenzie Forbes had got him to join the staff in a consulting capacity. The hospital at that time occupied a house that had been built for a private residence at the corner of Lincoln Avenue and Guy Street. There was no room in it for staff meetings so they were held at Mackenzie Forbes's residence or at a club.

Archibald was always a delicate man but I think he early made up his mind that he would not allow physical disability or fatigue to interfere with his work or anything else he wanted to do. After his visit in 1944 to the front in Belgium and Holland, where he went to collect material for his book on war surgery, he returned to London. There he got transportation in an aeroplane and flew down to this quiet spot in Devonshire to visit my wife and me. We were shocked at his appearance; he looked so old and ill. He was just as good company as ever. He told us immediately after dinner that he must go to bed very soon as he had fever. We did not succeed in getting him to go there until after midnight. All the luggage he brought with him was a large x-ray plate and a despatch case full of notes. He left next day.

Others can speak better than I can of his research work and of the new paths in surgery he opened up or suggested. No one can speak with more knowledge than

Dr. Benson attended Port Hope High School and later the University of Toronto, graduating as a medical doctor from the latter with a brilliant scholastic record. He became an Honour Graduate in Medicine in 1911 and distinguished himself further by winning the Chappell Scholarship. He maintained an active connection with his medical colleagues at home and further afield. He was a member of the Ontario Medical Association, in which at the time of his death he was district vice-councillor, district No. 6; he also held memberships in the Northumberland and Durham Medical Association, the Canadian Medical Association, and the American Medical Association, and was a member of the Honorary Medical Fraternity of Alpha Omega Alpha.

He is survived by his widow and two sons.

Dr. Barton B. Bridge, of Storm City, Iowa, died recently from a motor accident.

Born at Westbrook, Dr. Bridge went to Iowa following his graduation from Queen's University in 1900, and became one of the pioneer doctors of the horse and buggy era in the northwestern part of the state.

He had received all his early education in the schools at Westbrook and Sydenham and was awarded the gold medal when he obtained his degree in medicine in Kingston.

Dr. Avila Charron, former medical control officer at the city hall, died January 21, at the Sacred Heart Hospital in Cartierville after a long illness.

Dr. Charron was born in 1886 at Vercheres. He studied at the L'Assomption College and at the old Laval University of Montreal. He was a general practitioner at one time at St. Andre Avellin and in St. Henri in Montreal.

He leaves a brother and two sisters.

Dr. Ashton Bluett Cutliffe died at his residence in Brantford, Ont., January 23. He was born in Swansea, Wales, August 11, 1869 and came to Canada with his parents in 1870.

Dr. Cutliffe was educated in public schools at Mount Pleasant and Brantford and at the Brantford Collegiate Institute. He graduated from the Ontario Veterinary College with honours in 1892. He served through the First Great War, rising in rank and honour and was Food Inspector for the City of Brantford from 1921 to 1937.

Surviving are his widow and two daughters.

Dr. Oscar Glennie Donovan died suddenly at his home in Halifax on January 27, 1945. He was born at Hansford, Cumberland County, N.S. May 22, 1883. He was educated at Truro Academy and Dalhousie University, graduating in Medicine in 1906. After a year of internship at the Victoria General Hospital and a year as a ship's surgeon, he began a general practice at New Germany, Lunenburg County. As a young man he joined the militia and on the outbreak of Great War I, joined the Royal Army Medical Corps as a lieutenant. After one year's service in France he transferred to the Royal Canadian Army Medical Corps, where he served until the Armistice and for several months during the period of occupation. Before returning to Canada he took a course in orthopaedic surgery with Sir Robert Jones, Liverpool. On his return to Canada he was appointed to the staff of Camp Hill Military Hospital, Halifax, where he served until 1934. In that year he became Medical Officer of the Workmen's Compensation Board of Nova Scotia, later becoming Chief Medical Officer on the retirement of Dr. M. D. Morrison. At the outbreak of World War II he volunteered for active service but was eventually designated Officer Commanding, 22 Reserve Field Ambulance. Besides several service decorations he twice received the Croix de Guerre.

Dr. John Joseph Heagerty, aged 66, a former director of Public Health Services for Canada, died in hospital in Ottawa on February 7, after an illness of two weeks.

A veteran of three decades of public health service, he was perhaps best known for his 865-page report on public health in Canada, which formed the basis for the draft Health Insurance Bill presented to a Parliamentary committee in 1943.

He stepped down from the post of Director of Health Services on reaching retirement age in 1944 after a record of service with Federal health agencies dating back to 1911. He continued to serve the department as special assistant to the deputy Health Minister.

Born in Montreal a few years after his father moved there from a farm in New York State, he graduated in medicine from McGill University in 1905 and immediately set out on a trip around the world as a ship's doctor. He made a study of tropical diseases and public health insurance in Germany.

He was first employed by the Federal Government as a bacteriologist at Quebec in 1911 when a ship arrived with cholera among the passengers. Winning the Degree of Doctor of Public Health at McGill in 1912, he returned to the Department as head of a quarantine hospital at Grosse Ile, Que. He remained there until 1919 except for a first Great War assignment as quarantine officer at Saint John, N.B.

In 1919 he became chief of the venereal disease control division at Ottawa. He was appointed chief of health services in 1937.

Dr. Heagerty was author of several books on medical subjects, including "Four Centuries of Medical History in Canada" and "The Romance of Medicine in Canada."

He was honoured in the New Year's honours list of 1943 when he became a Companion of the Imperial Service Order.

Survivors include his widow, a son, John S. Heagerty of Montreal; a daughter, and three sisters.

Dr. Llewellyn Clayton Hills, 63 years of age, died suddenly in Victoria Hospital, London, Ont., January 19, following a severe heart attack.

Dr. Hills taught school at New Canaan for six years before entering medicine at Western University. Following graduation he opened his practice in Kingsville, Ont., where he continued until enlistment in the C.A.M.C. in July 1941.

In 1929-30-31, he served as a member of the town council and 1933-34-35 he was Kingsville's mayor.

He was playing-manager of the local baseball club in the Essex County league for a period of 10 years, and was also secretary of the Essex Fishermen's Association for several years. He was a member of the First Baptist Church.

Survivors are his widow and one daughter.

Dr. E. W. Hixon died in Watrous, Sask., on December 28, 1945, aged 67.

Dr. Hixon taught school for seven years before entering medicine. He proceeded to the West and became one of the pioneer medical men of the old Grand Trunk Pacific Railway. He established a practice in Watrous when the town had been barely staked out as a town.

Dr. Hixon had been mayor of Watrous and chairman of the Public School Board, and was looked upon as one of the most public-spirited citizens of the town.

He is survived by his widow.

Dr. Austin Irvine, a graduate in medicine from McGill University, died in the south of France recently.

Dr. Irvine was a football and lacrosse enthusiast. He was President of the Montreal Football Club in 1906 and 1907, which won the Dominion championship in the latter year.

Dr. Irvine is survived by his widow and two sisters.

Dr. Rupert Leblond est mort le 17 de décembre dans un hôpital de Régina. Il était âgé de 58 ans. Un mois auparavant il avait dû s'aliter atteint d'une embolie qui lui paralyse le côté gauche.

Le docteur LeBlond était un diplômé de l'Université Laval de Québec. Plus tard il dut prendre certains cours à Chicago et à Madison.

Lui survivent, son épouse, deux fils et deux filles.

Dr. M. Murray MacDonald died in the Saint John General Hospital January 21, 1946, after a long illness at the age of 53 years. He was born in Pictou County, N.S., and received his early education in the schools of Sydney Mines and Colchester Academy, and his medical degree from Dalhousie University in 1916. His internship was served at the Victoria General Hospital, Halifax. Postgraduate studies at various periods were followed at New York Post-Graduate Hospital and in London and Edinburgh. In the first Great War Dr. MacDonald served as a captain in the C.A.M.C. in England, France and Germany and in this war he was regimental medical officer to an aircraft battery in Saint John from 1939 to 1943, when due to illness he was discharged. From 1943 till his death he was medical adviser to the N.B. Board of National Selective Service. For the past 13 years he practised in Saint John and served as a junior physician on the hospital staff. Previously he had practised in Pictou and Westville, N.S.

Dr. MacDonald was a Presbyterian and a mason. He is survived by his widow and one daughter. He was a typical highland Scot, slow spoken, kindly, hardworking and beloved by his large number of patients. His care of the dependents of the troops he served as medical officer in this war will always be remembered as an example of his conscientious voluntary thoughtfulness for others no matter what the cost in worry or fatigue to himself.

Mrs. Charles A. McDonell, M.D., aged 76, former physician of Forest, Ont., and resident of Hensall for many years, died in Listowel January 12. She was one of the first women to graduate in medicine in Ontario.

Formerly Dr. Mary Jane Hutton, daughter of the late Dr. James Hutton, of Forest, she graduated from Trinity University, Toronto, in 1890, at the age of 20, and became associated with her father in the practice of medicine.

Surviving are two daughters.

Dr. James Kenneth McGregor, of Hamilton, died at his home on January 23, after a month's sickness. One of the foremost among Ontario surgeons his loss is mourned by his colleagues in every part of the province.

Dr. McGregor was born in 1881 in Waterdown, Ont. He was educated in the schools of his native town and graduated M.B. from the University of Toronto in 1904. He studied in Europe for several years and worked for a time in the Mayo Clinic where his training was facilitated by his friendship, dating from boyhood, with Dr. Donald Balfour. He began practice in Brantford but returned to a partnership with his father in Waterdown after one year. In another year he moved to Hamilton where he shared an office with the late Dr. Mowbray. In 1922 the McGregor-Mowbray Clinic was formed and on Dr. Mowbray's death in 1931 it became the McGregor Clinic which is to continue under that name in Hamilton.

When the Clinic was opened the surgery of the thyroid gland was in process of standardization. Dr. McGregor turned his attention to the many problems then unsolved and read papers on the subject at the Academy of Medicine, Toronto, and scientific societies elsewhere. In 1940 he was made President of the American Association for the Study of Goitre after long service on its executive. For two years he was Surgeon in Chief to the Hamilton General Hospital.

Dr. McGregor never courted popularity but nevertheless attained it. He was intolerant of pretence and incompetence and held himself rigidly to a high standard of ethics and professional work. The influence of such a man is incalculable. Aside from his work as a surgeon his efforts as a humanitarian endeared him to his fellow citizens. One of his principal outlets was his interest in crippled children.

Dr. McGregor was a founder of the Hamilton Academy of Medicine, Fellow of the Toronto Academy of Medicine, Fellow of the Royal College of Surgeons of Canada and of the American College of Surgeons. He is survived by his widow and a daughter.

Dr. John McKenzie died in Mount Forest, Ont., on January 27. He was in his 68th year.

He was born in Holstein, Ont., and attended Mount Forest High School and graduated from Queen's University.

He is survived by his widow.

Dr. Cecil Stanley Mahood died in Simeoce, Ont., on February 3, at the home of his son-in-law and daughter, Capt. W. S. White and Dr. Gwen White. He was in his 66th year.

Le Dr Léopold Masson, de Terrebonne, est décédé subitement le 4 février.

Lui survivent, son épouse, un fils et une fille.

Dr. John James Matheson, coroner and medical practitioner for 30 years, died at his home in Toronto, February 3.

Dr. Matheson was born in Bloomington, near Stouffville, and moved to Embro, Oxford County. He attended Model School at Ingersoll and Markham High School. He was a graduate in 1904 in medicine from the University of Toronto and took postgraduate work in Edinburgh, Glasgow and Dublin and received the degrees of L.R.C.P.S. and L.F.P.S.

A coroner for the City of Toronto, he was also on the staff of Western Hospital. Dr. Matheson was a life member of Victoria Lodge, A.F. & A.M. and the Knights of Pythias. He was one of the original members and contributors to the building fund of High Park Methodist Church, now United Church.

Dr. Matheson maintained a summer home at Bala, Muskoka, and was active in fishing and hunting.

Surviving are his widow and daughter.

Dr. Joseph Alexander Morgan, aged 75, died in Peterborough, Ont., February 3.

Dr. Morgan was medical health officer for Smith Township, Ont., for 43 years and for North Monaghan Township for 23 years. He graduated in medicine from the University of Toronto in 1897.

He is survived by a daughter and a brother.

Dr. John F. Mulligan, aged 35, died in Toronto on January 5, after a brief illness.

Born at New Liskeard, Dr. Mulligan was a graduate of St. Michael's College and of University of Toronto in medicine in 1937. He later took a postgraduate course in John Hopkins hospital, Baltimore. He joined the Weston hospital in 1940.

Dr. Aurèle Nadeau, 75 ans, membre du Collège des Médecins de Québec, est décédé le 20 janvier à l'hôpital du Saint-Sacrement, Québec. Originaire de St-Fréderic, (Beauce), le Dr Nadeau gagna la bourse du Prince de Galles en 1888 alors qu'il était étudiant au collège de Lévis. Après de brillantes études aux universités Laval de Québec et de Montréal, il était diplômé docteur en médecine en 1893.

Dr. Henry Howard Planche, prominent former Burnaby physician and civic official died in St. Paul's Hospital, Vancouver, on January 12.

Dr. Planche was active in civic and municipal affairs in Burnaby for the past 30 years.

From 1926 to 1928 he was councillor for Ward 5, Burnaby, and he later served on the School Board. Dr. Planche was Burnaby coroner from 1932 until 1944 and was also prison doctor at Oakalla.

Surviving are his widow, a son, and two daughters.

Dr. J. B. Pritchard, of Ottawa, died suddenly on January 7, at the age of 47, of a heart attack. He was born in North Wakefield and graduated in medicine from Toronto in 1923. He was a fine athlete and was a well known figure in football, both as a player in his younger days and afterwards as club physician. He leaves a widow and two children.

Dr. Donald M. Robertson, aged 70, a teacher and river boat captain before turning to the medical profession which brought him the superintendency of Ottawa Civic Hospital, died in the hospital which he once had headed.

After graduating from McGill University in 1898 he came to Ottawa and shortly was appointed superintendent of the County of Carleton Protestant General Hospital, a post he held for 21 years.

In 1924 he was appointed the first superintendent of Ottawa Civic Hospital, resigning that position in 1939. During the second Great War he served as director of hospital supplies for the munitions department.

He was for a time president of the Ontario Hospital Association, of which he had been a director since its formation more than 35 years ago.

A lover of horses, he was a regular entrant at shows in Toronto, Montreal and Ottawa.

Dr. R. O. Ross, of Stanstead, Que., died at his home January 17. He would have been 80 years of age February 20.

Dr. Ross, who had practised medicine in Stanstead for the last 43 years, was born at Margaree, N.S., and completed his studies in Montreal, where he attended Congregational College and McGill University. He received his doctor's degree at McGill in 1895.

Taking up practice in the United States, he lived at Pittsburgh, Mass., and Derby Line, Vt., until 1903, when he took up residence in Stanstead.

Dr. Ross was a long-time member and a past grand master of the Golden Rule Masonic Lodge, Stanstead.

He is survived by his widow, two daughters and one son.

Dr. Michael Steele, ex-M.P., of Tavistock, died on January 1, at Vienna, Ontario.

He was born at Avonbank on July 24, 1860. He spent his early youth on the farm there, and then attended the University of Toronto. He had been practising medicine for 57 years.

While in Stratford, Dr. Steele was a member of Knox Presbyterian Church, serving as an elder on the Board of Session, and on the Board of Management of the church.

Dr. Steele represented the constituency of South Perth from 1911 until 1921 as the Conservative member in the House of Commons at Ottawa.

Dr. Steele was married three times, surviving him are two daughters.

Dr. Charles Ritchie Symmes, aged 70, died on January 3 in St. Paul's Hospital, Vancouver.

Born in Aylmer, Quebec, he lived and practiced in Port Moody 38 years.

He belonged to the B.C. Medical Association and was a member of the Masonic order.

He is survived by his widow, two sons and four daughters.

Dr. Euloge Tremblay est décédé le 29 janvier à l'hôpital du St-Sacrement à Québec.

Il était âgé de 68 ans et il est décédé le jour même de son anniversaire de naissance. Il était né le 29 janvier 1878 à Baie St-Paul. Il étudia au Séminaire

de Chicoutimi et au collège de Lévis et à l'Université Laval où il gradua en 1903. Il s'établit à Baie St-Paul; et depuis trente cinq ans, il était surintendant médical de l'hospice Ste-Anne.

Lui survivent, son épouse, trois fils et une fille.

Dr. M. J. O. Walker died at his home in Merrickville, Ont., January 22.

Dr. Walker was born at Portland 62 years ago. He graduated from Queen's in 1907. He took up residence in Merrickville thirty-three years ago, and for a greater part of that time Dr. Walker had been the only practising physician in the village. A member of Holy Trinity Church, Dr. Walker was active in philanthropic work and community affairs and for a number of years had served on the local Municipal Council.

Surviving are his widow, three daughters, one grandson, a brother and one sister.

NEWS ITEMS

Alberta

More and more municipal districts in the Province are asking for municipal hospitals. Many of the districts have been without doctors since the war and there is a feeling that to get a doctor now they must have a hospital to attract one. A few hospitals under construction are at Oyen, to be ready within the next two months; Ponoka, to be ready about June 1; Mayerthorpe, ready about May 1; Elnora, Two Hills, Three Hills, Cereal and the Crows Nest Pass, will have hospitals by fall.

More than a dozen other districts are planning to municipalize their hospitals.

At the annual meeting of the Council of the College of Physicians and Surgeons of Alberta, Dr. W. A. Lincoln of Calgary was elected President and Dr. L. M. Rogers of Camrose, Vice-President. The Council will miss the services of Dr. A. E. Archer of Lamont, who has been a member for twenty years. Dr. Archer is presently doing very valuable work for the Canadian Medical Association. Other retiring Council members are Dr. A. E. Kennedy, Stettler and Dr. D. N. MacCharles, Medicine Hat.

An application from a doctor to register with the College was refused when, on investigation, it was shown that he had been addicted to the use of narcotics.

There have been many doctors returning to civilian practice from the forces during the last two months. Most of these seem to be locating in either Edmonton or Calgary. Twenty-six doctors have gone into Edmonton, of these ten previously were there. Fifteen doctors have indicated their intention of practising in Calgary, of these four were previously located there.

The Department of Veterans' Affairs have, at the present time, fifteen full-time men, five part-time, and six consultants in Calgary. In Edmonton they have eight full-time doctors and sixteen part-time men.

G. E. LEARMONT

British Columbia

The major activity in British Columbia at present is the preparation for the Seventy-Seventh Annual Meeting of the Canadian Medical Association to be held at Banff. All committees are working under full steam and things are shaping up well. Full particulars as to registration, application for space, and so on, are to be found elsewhere in this *Journal*.

There has been quite an outbreak of diphtheria in Vancouver, and one or two cases have been reported elsewhere. A family of carriers was discovered more or less accidentally, and several carriers have been identified since then. It is so long since diphtheria has been of any significance in this area owing to the prevalence of inoculation that this is the more disquieting. The situation, however, is coming under control, and has never reached epidemic proportions.

Dr. A. E. Archer, consultant in medical economics for the Canadian Medical Association and past president, visited Vancouver recently with Dr. T. C. Routley, General Secretary. While their visit was primarily connected with the forthcoming annual meeting of the Canadian Medical Association, Dr. Archer's presence was of great assistance to the Committee on Economics of British Columbia. He visited Victoria where he met the Victoria Medical Society.

The newspapers of the larger cities have at last awakened to the seriousness of the hospital situation, and many descriptive articles have appeared on this matter. The situation has long passed the serious stage and is becoming critical, but this would appear to be general throughout Canada, and its remedy must, we suppose, await the pleasure of those in authority.

The report of the Medical Services Association of British Columbia shows a very prosperous and successful condition of affairs. This Association now covers a great number of firms in the Province and is doing excellent work. Its financial condition is sound and everyone is well satisfied with its work.

Among the medical officers who have recently received their discharge and have resumed practice are the following: Lieut.-Col. E. H. W. Elkinson, Major L. W. Bassett, Major N. C. Cook, of Victoria; Major U. P. Byrne, Flight-Lieut. J. F. Sparling, New Westminster; Flight-Lieut. D. B. Ryall, McBride; Capt. N. Shklov, Vernon; Major G. C. Johnston, Major T. K. MacLean, Major Henry Scott, Major W. A. Morton, Major C. H. Gundry, Major J. Ross Davidson, Major W. L. Boulter and Major H. H. Boucher, of Vancouver.

J. H. MACDERMOT

Manitoba

On Christmas Day Capt. Maurice Victor, R.C.A.M.C., was decorated by Queen Wilhelmina at the royal palace in The Hague with the insignia of a Knight Officer of the Order of Orange Nassau with Swords. Capt. Victor accompanied the air-borne troops in their descent at Arnhem. He is a son of Dr. B. A. Victor, of Winnipeg.

Dr. Gladstone W. Fiddes, of Ocean Falls, B.C., has been appointed medical superintendent of the Brandon General Hospital and will take over his new duties in February. A graduate of Queen's University in 1940, he did research work in Ontario before proceeding to British Columbia.

The total number of participants in Manitoba Medical Service at December 31 in Plan A, Surgical, was 2,962, and in Plan B, Medical, was 22,153, a total of 25,115. Plan A gives services limited to surgery and obstetrics in hospitals, while Plan B gives total coverage. In the fifteen months of operation Plan A has operated at a slight profit, but Plan B has incurred heavy deficits. A loss was anticipated in the first year of operation, but it was not expected that the public would so greatly prefer the more expensive plan. It is possible that some modification may have to be made in Plan B.

ROSS MITCHELL

New Brunswick

Dr. Gilbert B. Peat, Chief of the Department of Obstetrics at the Saint John General Hospital has resigned his appointment. From the inception of this service in Saint John Dr. Peat has headed the service.

Dr. Percy J. Lozier has resumed practice at Chatham, N.B., on discharge from the R.C.A.F. Medical Service.

Dr. F. C. Jennings, of Saint John, has received the M.B.E. decoration for service in the R.C.A.M.C. from which he was recently released.

Dr. T. S. Dougan, of Sussex, N.B., has begun a three months' course of study at the Cook County Graduate School of Medicine.

Dr. K. A. Baird, of Saint John, was elected a Fellow of the American College of Allergists at their December meeting.

Dr. C. E. Brooks, of Montreal, who while serving in the Naval Medical Service was stationed for a long period at Lancaster Hospital, Saint John, as surgical consultant was promoted to the rank of A/Surgeon Commander at New Years.

Dr. G. C. Leger, of Buctouche, has resigned as District Medical Health Officer to resume private practice.

Dr. R. A. H. MacKeen has returned to Canada after completing his evidence at the German war trials and has resumed his duties with the New Brunswick Department of Health Laboratories.

Under the direction of Dr. J. A. Melanson a chest survey is being made of all High School pupils and teachers in Moncton.

Dr. Arnold Branch who supplied as Director of Laboratories of the Department of Health while Dr. R. A. H. MacKeen was overseas has been appointed Director of Laboratories at Lancaster Hospital, D.V.A.

St. James Military Hospital at Saint John has been taken over by the D.V.A. and Lieut.-Col. W. O. McDonald who has commanded St. James Hospital is shortly to be demobilized.

Dr. Douglas Gibbon on demobilization from the Air Force Medical Service has joined the D.V.A. staff at West Saint John.

Dr. John A. McLaughlin has been discharged from the R.C.A.M.C. and has been appointed Chief Medical Officer for the N.B. Workmen's Compensation Board.

Dr. P. McL. Atkinson has retired from the senior surgical staff of the Moncton City Hospital. Dr. Atkinson retains his appointment as Chief Consultant in diabetes.

Dr. H. M. McLean on return from overseas has been appointed to the senior surgical staff of the Moncton City Hospital.

New registrations by N.B. Medical Council include Dr. Carl R. Trask at Riverglade, Dr. Roderick S. Ideson at Harvey Station and Dr. Chas. H. Johnson at Bathurst.

Dr. R. P. Vivian head of the new Department of Health and Social Medicine of McGill University was the guest speaker at the January meeting of the Saint John Medical Society. Dr. Vivian discussed his conception of social medicine especially the educational feature and had some very common sense comments

on health insurance and state medicine. His address was most informative and discussion of questions from the audience was witty and helpful. Dr. C. W. MacMillan of the same department accompanied Dr. Vivian. Dr. K. A. Baird was chairman. Dr. Vivian's visit gave this Maritime audience an early view of the interesting adventure in social medicine sponsored by McGill.

Dr. R. T. Hayes is the new president of the Medical Board of the St. Joseph's Hospital, Saint John.

Hon. Dr. F. A. McGrand, Provincial Minister of Health has announced the appointment of Dr. R. D. Landry, of Moncton, as District Medical Health Officer for the three southeast counties of N.B. Dr. Landry served overseas with the 14th Field Ambulance and on his return to Canada specialized in radiology.

Dr. H. R. Bryant who has practiced in Grand Manan for many years has left for postgraduate study in Chicago, following which he will locate elsewhere. He has been succeeded by Dr. J. Thompson.

A. S. KIRKLAND

Nova Scotia

Dr. John F. L. Woodbury, son of Dr. Frank Woodbury, Medical Examiner for the City of Halifax, has been recently discharged from the R.C.A.M.C. and has opened an office in Halifax.

Dr. J. C. Worrell, recently discharged from the Services, has resumed his practice as assistant to Dr. A. E. Murray, of Halifax.

Dr. J. E. Hiltz, acting superintendent of the Victoria General Hospital, will leave shortly to open the new hospital at Shelburne, which was taken over by the Provincial Department of Health in the Autumn of 1945. The Institution will be devoted in part to general hospital work, but the majority of beds will be for the care of tuberculosis patients.

Dr. C. M. Bethune has returned from an extended trip to the United States where he reviewed recent hospital advances and conferred in Chicago with the architects of the new hospital which is under construction.

Major J. C. MacDonald, until recently stationed at Debert, N.S., is now at Camp Hill Hospital, Halifax. In future his duties will be in connection with the Department of Veterans' Affairs.

On February 1, 1946, Dr. M. J. Carney retired from the visiting staff of the Victoria General Hospital, Halifax, after many years of excellent service.

His many friends throughout the Province will regret to learn of the recent illness of Dr. M. R. Young of Pictou. His son, Dr. J. A. F. Young, recently discharged from the R.C.A.M.C. has returned to practice in that town.

Dr. Carvell MacIntosh, of Antigonish, who is pursuing postgraduate work, has been appointed radiologist and pathologist to St. Martha's Hospital on completion of his course. Meanwhile the radiologist service is under the supervision of Dr. A. E. Blackett of New Glasgow.

The many friends in Nova Scotia were very sorry to learn of the death in Saint John, of Dr. Wilfred Murray MacDonald. Before going to Saint John, Dr. MacDonald practised both in Pictou and in Westville.

H. L. SCAMMELL

Ontario

The annual meeting of the Ontario Medical Association will be held in Toronto in the week of May 20, 1946. The scientific program is in the capable hands of the President, Dr. Wm. Magner. The commercial exhibit promises to be outstanding as space is being sought so eagerly that the accommodation is already allotted almost to its full extent. This meeting will welcome home a large number of its members who have been in the armed forces. As of February 1, 775 of these have returned to Ontario. The Secretary is embarrassed to some extent by the difficulty of securing the mailing addresses of many of these newly returned officers.

The committee in charge is having its trouble with the scarcity of accommodation in hotels in Toronto. The situation is being handled with foresight and sleeping quarters may be confidently promised to out-of-town members of the association.

Dr. G. Douglas Taylor, addressed the Peterborough County Medical Society on January 16, and his presentation was deeply appreciated by the members. Dr. Taylor was, before the war, on the staff of the Royal Victoria Hospital in Montreal. He served in Canadian general hospitals overseas and made a valuable survey of the incidence of arthritic disorders in the Canadian army. He has begun practice in the Medical Arts Building, Toronto and has announced a special interest in arthritis and rheumatic disease. Certain phases of this large subject were discussed in the Peterborough address.

The London Academy of Medicine met on January 8, in St. Joseph's Hospital. Dr. Elizabeth Forbes presented a case described as "a cardio-vascular-renal problem". Dr. Vincent A. Callaghan discussed "Intertrochanteric fractures of the femur" and Dr. Albert E. Mowry, the "Management of the third stage of labour".

The Academy of Medicine, Toronto, was addressed on January 8, by David M. Davis, Professor of Urology, Jefferson Medical College, Philadelphia. The subject was "Ureteral obstruction: recent advance in its embryology, nosology and surgery". The guest speaker was entertained at dinner by the Academy before the meeting and was greeted by a large audience. The paper was enthusiastically received and will be published in the *Bulletin* of the Academy.

The offices of the Canadian and Ontario Medical Associations are soon to be evacuated. Space has been secured in a large building on the corner of Avenue Road and St. Clair Ave., Toronto. This structure was built for a training school for deaconesses and during the war was taken over as a barracks for W.A.A.F. personnel. It is of convenient access and more space will be available than was afforded by the quarters now occupied by the headquarter staff of the Association.

Dr. Kenneth McGregor of Hamilton, died on January 22, 1946. An obituary notice on another page will sketch the life and attainments of one of the most prominent Ontario surgeons. His influence extended far beyond his own district and that influence was always exerted to improve ethical and professional standards among the practitioners of the province.

Dr. Lillian Chase, who so ably represented Saskatchewan on the editorial board of this *Journal* before the war has arranged to enter practice in Toronto as soon as she is released from the army. She will confine her work to her specialty in diabetes.

One hundred and thirty-eight students in the Faculty of Medicine, University of Toronto, wrote their final examinations in the last week of January.

The officers for the Porcupine District Medical Society, for 1946, are as follows: *Past President*—Dr. W. S. Paul, South Porcupine; *President*—Dr. G. B. Lane, Municipal Building, Timmins, Ont; *First Vice-president*—Dr. C. M. Boutin, 30 Third Ave., Timmins; *Second Vice-president*—Dr. C. R. MacLean, 24 Pine St. N., Timmins; *Secretary-Treasurer*—Dr. James B. McClinton, 6 Pine St. N., Timmins.

This Society comprises all the doctors north of Kirkland Lake.

The B. T. McGhie Memorial Lectureship.—Since the death of Dr. McGhie, the former Deputy Minister of Health for Ontario, a number of his friends, many of whom are Faculty members at the University of Western Ontario, decided to establish a lectureship in his memory. Although Dr. McGhie contributed greatly to the health of the people of the province in his official position, he was particularly interested in medical education and encouraged in all Ontario medical schools the better teaching of public health and social medicine and the closer integration of psychological medicine with general medicine. While Superintendent of the Westminster Military Hospital, he was a member of the teaching staff of the University of Western Ontario.

On January 18, 1946, approximately one year after his death, the inaugural lecture in this lectureship was delivered in the Medical School Auditorium by Dr. E. A. Strecker, Professor of Psychiatry at the University of Pennsylvania. The subject of his address was "Motherhood and Momism—effect on the nation". It dealt with the crippling effects of certain unhealthy maternal attitudes on the personalities of children as revealed in young adults, particularly in the military services. Dr. Strecker was a divisional psychiatrist in the American Army in World War I and special civilian adviser on psychiatric matters to the Surgeon General of the Army and Navy in World War II.

The lecture was preceded by a clinic for the medical students. It is expected that lectures in this lectureship will be delivered annually by similarly distinguished authorities in the field of social and psychosomatic medicine.

Friends of the late Dr. McGhie who desire to participate in this memorial are invited to send their subscription to Dr. G. H. Stevenson, Professor of Psychiatry, University of Western Ontario. Cheques should be made payable to the University.

M. H. V. CAMERON

Prince Edward Island

Dr. Wilfred Callaghan, formerly of New Waterford, Nova Scotia, is now practising at Souris. The service offered by the hospital recently opened in Souris is deeply appreciated by the residents of this section of the province.

On October 15, 1945, Dr. Callaghan was united in marriage to Miss Catherine MacEachern, of New Waterford.

Dr. Austin Delaney, of Summerside, recently ill with pneumonia, is now convalescing at home.

Dr. Eric Found of the Provincial Sanatorium has been elected president of the Charlottetown Gyro Club.

The Provincial Government has appointed Dr. C. M. Chaplin as assistant in bacteriology to Dr. Harold Shaw, Provincial Pathologist and Director of the Provincial Laboratory. Major Shaw recently returned from serving with No. 7 Canadian General Military Hospital. Dr. Chaplin, born in England, has taken his university training in Canada, obtaining his science degree in Bacteriology and Immunology from McGill in 1936. At the outbreak of war he went

overseas with the No. 7 Canadian General Military Hospital as bacteriologist, and at the present time he is completing his master of science degree at MacDonald University; it is expected that he will soon assume his new duties.

Dr. L. E. Prowse is now practicing in Charlottetown, graduating from Toronto University in 1940, he joined the navy in 1941, in June, 1944, was promoted Surgeon Lieut. Commander. In His Majesty's New Year's Honour List, Dr. Prowse received recognition for his bravery on the occasion of the explosion at the Naval Magazine, Bedford, Halifax, July, 1945.

Dr. W. H. Soper has now resumed his practice in Charlottetown, and will specialize in gynaecology and obstetrics. Lieut.-Col. Soper has been recently released from the Army Medical Corps.

Dr. Fred C. MacArthur, until recently serving with the military forces, has now taken over the office and practice of Dr. Henry Moyse at Bedeque.

Dr. J. B. Downing, of Summerside, and recently released from the Canadian Army is establishing a practice at Carleton Siding.

Dr. Gilbert J. Gallant has established a practice at Kinkora. Dr. Gallant was born in Maine, coming to Prince Edward Island when two years of age. Received his B.A. from St. Joseph's College, N.B., in 1934, taught school 1934 to 1939; graduated from the University of Montreal, July, 1944, and transferred from the C.A.S.F. to the R.C.A.F. from which he received his discharge December, 1945. His wife was the former Miss Eva Arsenault. They have one daughter.

A. J. MURCHISON

Quebec

Le nouvel exécutif de la Société Médicale de Montréal comprend: le Dr Armand Frappier, président; le Dr Edouard Desjardins, vice-président; le Dr Origène Dufresne, secrétaire-général; le Dr François Archambault, trésorier et le Dr Jean Denis, secrétaire des séances.

La Société Médicale de Montréal célébrait le cinquantenaire de la mort de Pasteur le 29 novembre dernier par un dîner-causerie qui avait lieu au Cercle Universitaire sous la présidence de Mgr O. Maurault, recteur de l'U. de Montréal. Le Dr Simonnet de Paris était le conférencier d'honneur.

La Société de Chirurgie de Montréal a élu à la présidence le Dr J. H. Rivard. A la Société de Gastro-entérologie, le même poste fut confié au Dr Roger R. Dufresne. A la Société de Phtisiologie on désigna le Dr Léo Ladouceur.

Quatre-vingt six étudiants en médecine viennent de recevoir des bourses pour l'année 1945-46, en vertu du plan d'Aide à la Jeunesse. Ces bourses représentent une somme de \$12,000, accordée à la faculté de médecine, proportionnellement au nombre de ses étudiants.

Le Centre d'Apprentissage, situé à Montréal, au No. 2275 est de la rue Laurier vient d'ouvrir ses portes. Il y aura là une clinique médicale qui aura pour but de réadapter les victimes d'accidents du travail et même d'orienter ceux qui souffrent d'invalidité partielle vers les métiers qui leur conviennent le mieux. Le Dr D. Léonard, radiologue réputé, dirige cette nouvelle clinique, pourvue des meilleurs

appareils de physiothérapie, de mécanothérapie, d'hydrothérapie et de rayons X.

Les directeurs de l'hôpital-Sanatorium Cooke des Trois-Rivières viennent d'annoncer que le gouvernement a décidé de porter à 300 le nombre des lits de cette institution où l'on ne recevait jusqu'à maintenant que 150 malades. **JEAN SAUCIER**

Saskatchewan

A special meeting of the Regina District Medical Society was held on January 21, 1945, to welcome back its many members who had served in the armed forces. The guest speaker of the evening was Dr. Grant, of the Public Health Section of the Rockefeller Foundation.

The joint committee on membership of the Medical Staffs of the Regina General Hospital and the Grey Nuns' Hospital, has dissolved. This committee functioned throughout the war years and made recommendations regarding membership, etc., on the staff of each of these hospitals. A recommendation which was made at the final meeting of the committee was that a new joint committee be set up representing the staffs of both hospitals. It would be the duty of such committee to exercise control of the practice of medicine and surgery in the Regina Hospitals.

The appointment of Dr. H. E. Baird, as Superintendent of Regina General Hospital, has been announced. Dr. Baird served with the R.C.A.M.C. for the past five years, being last connected as Officer Commanding the Sussex Military Hospital. Dr. Baird comes from Fredericton, New Brunswick.

The College of Physicians and Surgeons of Saskatchewan, is now collecting an annual fee of \$25.00, which will include membership in the Canadian Medical Association for all its members. Free membership has been granted for the year 1946 to all members who served in the armed forces and recently discharged.

Announcement has been made of the formation of two health regions, No. 1 in the Swift Current area, and No. 3 in the Weyburn-Estevan area. Regional boards are being set up with representatives from each of the urban and rural municipalities within the area. These boards are from 70 to 90 members, are authorized to arrange for Public Health Services in the region and are expected to interest themselves in the improvement in hospital diagnosis and medical care facilities in the region. A Medical Health Officer and staff will be employed in conjunction with the Department of Health. The Medical Health Officer is a member of the executive committee of nine members appointed by the board to act on its behalf in administering the region. The regulations provide for the formation of a Medical Advisory Committee from among the physicians in the region.

The province has been tentatively divided into fourteen regions by the Health Services Planning Commission of the Department of Health.

B. BRACHMAN

General

Medical Missionaries in China.—Word has been received by the Board of Overseas Missions of The United Church of Canada at Toronto, that five of their missionaries to China have been signally honoured by being elected to Fellowships in the newly-formed China Chapter of the International College of Surgeons. Upon nomination by the National Health Administration of China, 23 surgeons were elected as F.I.C.S.'s—13 Chinese nationals and 10 foreigners. Five of these latter were Canadians, all of whom are missionaries of the United Church of Canada. Those honoured are:

R. (Bob) B. McClure, M.D., F.R.C.S., director of the Friends' Ambulance Unit. Dr. McClure is the son of Dr. William McClure, of Toronto, who served fifty years in China in medical missionary work; his wife and children live in Toronto.

E. R. Cunningham, B.A., M.D., C.M., D.O.M.S., F.A.C.S., a graduate of Manitoba University, who served in the first World War before graduating in medicine in 1921, most of whose work in China has been given to the Medical College of the West China Union University as head of the Department of Ophthalmology; and his wife, Gladys S. Cunningham, B.A., M.D., M.R.C.O.G., native of Vancouver, graduate of McGill in arts 1915, and of Manitoba in Medicine 1921, who went to China a year later than her husband, and has been head of the Department of Obstetrics in the West China Union University.

E. C. Wilford, M.D., L.R.C.P. & S., F.A.C.S., graduate in Medicine, Toronto 1908 and L.R.C.P. Edinburgh the following year; 20 years head of the Department of Surgery in the West China Union University.

A. Stewart Allen, M.D., C.M., F.R.C.S.[C], graduate of McGill 1929, and since his return to China in 1938, in charge of the United Church Hospital in Chungking; has been active in medical and relief circles and been Chairman of the China Advisory Committee of the Canadian Red Cross Society and the Chinese War Relief Fund of Canada.

Doctors Edison R. and Gladys S. Cunningham and Dr. E. C. Wilford, are on furlough in Toronto at present. Dr. A. S. Allen, is specializing in chest surgery at the University of Michigan, Ann Arbor. Dr. R. B. McClure, is carrying on his work with the Friends' Ambulance Unit in China.

The United Church of Canada, whose missionaries have been so honoured, has for years been the largest single contributor of personnel to the West China Union University, Chengtu, not only to the Faculties of Medicine and Dentistry but also to Arts and Science. Five international church communions co-operate in the University which has about 1,500 students. During the war years its work has been outstanding and has received significant recognition from the Chinese government through citations and by financial assistance to its various departments. Dr. Leslie G. Kilborn, a second-generation missionary of the United Church, is the Dean of Medicine, and Dr. A. W. Lindsay, also a United Church missionary who returned last year, is Dean of Dentistry.

Colonel John C. Mackenzie, formerly general superintendent of the Montreal General Hospital and for several years actively engaged in hospital work in the Canadian Army overseas and in Canada, has resigned his civilian post from which he has been absent on a leave-of-absence and will devote himself to consultative work on hospital construction and related problems. Dr. Mackenzie's wide experience in civilian hospital management and construction and his intimate connection with the program of hospital expansion in the services have fitted him exceedingly well for his new undertaking. Dr. Mackenzie is leaving headquarters at Ottawa in the immediate future and will establish offices in Montreal.

The administration of medical care and hospitalization for the Indians and Eskimos of Canada was transferred by Order in Council from the Department of Mines and Resources to the Department of National Health and Welfare on November 1, 1945.

The appointment of G. D. W. Cameron, M.D., C.M., D.P.H., as director of public health services of the Department of National Health and Welfare was announced recently. He succeeds Dr. J. J. Heagerty who now holds the position of special assistant to the Deputy Minister of National Health. Dr. Cameron will continue

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also in his capacity as chief of the Laboratory of Hygiene.

The contract for the construction of the Sloan-Kettering Institute for Cancer Research in New York, has been signed. This is to be the research unit of the Memorial Cancer Centre.

The building will cost about \$2,000,000. This money, together with an additional \$2,000,000 to be supplied at the rate of \$200,000 a year for ten years to support partially the research work to be done at the institute, was assured by the Alfred P. Sloan Foundation, through the interest of Alfred P. Sloan, Jr., in the Memorial program. To complete the enlargement of the existing units of the centre—an enlargement which is necessary to retain an integrated balance of activities—the Memorial Cancer Centre Fund was established and is now seeking \$4,000,000 from the public to assure the continuity of the Memorial program.

American Society for Research in Psychosomatic Problems, 714 Madison Ave., New York 21, N.Y., will hold its Annual Meeting at Hotel Pennsylvania, New York City, May 11, 1946: a.m., Contributions of Military Medicine to Psychosomatic Medicine; p.m., Psychosomatic Aspects of Orthopaedic Practice. Annual Dinner: "New Advances in Psychosomatic Investigative Techniques" (An illustrated parody), Bertram D. Lewin, M.D., May 12, 1946, submitted papers. Registration fee for non-members is \$5.00 for two days; \$3.00 for one. The charge for the Annual Dinner is \$5.00. Limited hotel reservations are available.

The 28th annual meeting of the **American Dietetic Association** will be held at the Netherland Plaza, Cincinnati, Ohio, October 14, through 18, 1946.

"Courage and Devotion Beyond the Call of Duty".—Through the co-operation of Mead Johnson & Company, \$34,000 in War Bonds are being offered to physician-artists (both in civilian and in military service) for art works best illustrating the above title.

This contest is open to members of the American Physicians Art Association. For full details, write Dr. F. H. Redewill, Secretary, Flood Building, San Francisco, Cal.

David Anderson-Berry Prize in Radiology.—A David Anderson-Berry Silver-gilt Medal, together with a sum of money amounting to about £100, will be awarded in 1947 by the Royal Society of Edinburgh to the person, who, in the opinion of the Council, has recently produced the best work on the therapeutical effect of x-rays on human diseases.

Applications for this prize are invited. They may be based on both published and unpublished work and should be accompanied by copies of relevant papers.

Applications must be in the hands of the General Secretary, Royal Society of Edinburgh, 22 George Street, Edinburgh 2, by December 1, 1946.

UNRRA to Outfit 28 Hospitals in Europe.—Packaged as neatly as deliveries from a city department store, complete outfits for 28 hospitals, totalling more than 26,000 beds, are on the way to three stricken countries in Europe as result of efforts of special representatives of the United Nations Relief and Rehabilitation Administration, according to word received at the agency's Washington headquarters.

The hospital outfits, purchased from Army surpluses in the United Kingdom and on the European continent, are being trucked or shipped by sea to Poland, Czechoslovakia, and Yugoslavia. After VE-Day, the Army intended to trans-ship the outfits to Japan, but victory in the Pacific made that unnecessary. Hence, thousands of sick men, women and children in the three countries will have available in a short time hospital facilities which otherwise probably would not have been open to them for years.

The outfits are so complete that they include everything from surgical instruments to beds and blankets, account books and case record charts.

UNRRA will not supply buildings for the hospitals. The individual governments will furnish them, and the outfits furnished by UNRRA will transform them into operating institutions.

Institutions Accredited by the American Public Health Association to give the Degree of Master of Public Health (Diploma of Public Health in Canada) for the Academic Year 1946-47.—This list is released by the Executive Board of the American Public Health Association as of January 25, 1946.

Columbia University School of Public Health, Harvard University School of Public Health, The Johns Hopkins School of Hygiene and Public Health,

University of California School of Public Health, University of Michigan School of Public Health, University of Minnesota School of Public Health, University of North Carolina School of Public Health, University of Toronto School of Hygiene, Yale University School of Medicine, Department of Public Health.

The Executive Board of the **American Public Health Association** announces the 74th annual meeting of the Association to be held in Cleveland, Ohio, the week of November 11, 1946. An attendance of 4,000 is anticipated, representing every state in the United States, Canada, South America and many countries outside this hemisphere. Dr. Harold J. Knapp, Cleveland's Health Commissioner, has been appointed the chairman of the local committee.

BOOK REVIEWS

Cleft Palate and Speech. M. E. Morley, Speech Therapist to the Royal Victoria Infirmary, Newcastle-upon-Tyne. 160 pp., illust. \$2.25. Livingstone, Edinburgh; Macmillan, Toronto, 1945.

This book is a well written, comprehensive review of the subject of speech in relation to cleft palate repair. It is well worth perusal by all surgeons and speech therapists who are interested in cleft palate work. There has been a great need for such a work and the author deserves considerable credit for the clear manner in which the subject is presented. There are short sections on the embryology of hair lip and cleft palate followed by a few pages on the anatomy of the parts involved. The history of cleft palate repair is then dealt with in an effective, but sketchy manner. The remaining and larger portion of the book deals directly with speech development, speech defects and treatment of the patient by the speech therapist.

There are many illustrations which act as an effective supplement to the reading matter.

Fundamentals of Pharmacology. C. H. Thienes, Professor and Head of the Department of Pharmacology, School of Medicine, University of Southern California. 497 pp., illust. \$5.75. Hoeber, New York, 1945.

This is one of a new series of textbooks for medical students, published under the aegis of the Association of American Medical Colleges. It is designed to cover only the "basic foundations" of the subject, omitting material covered in the standard textbooks of pharmacology which is regarded as "non-essential" for the medical student. The book is therefore of limited value as a "specialist's reference work", as stated in the editor's preface. It is an attempt to solve the problem of textbooks for medical students, in view of the great and increasing expansion of the subjects of the medical curriculum as medical knowledge advances. It appears

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ONE of the best known of the early practitioners of Nova Scotia was Joseph Norman Bond. He was the first physician in Canada to use cow-pox vaccine.

J. N. Bond was born in Neston, Cheshire, England, on May 28th, 1758, the eighth son of Dr. James Bond. He studied for the medical profession in London and about 1779 came to New York on a merchant ship. The War of Independence was in progress and he at once joined the army. He was appointed a surgeon and was present at the surrender of Yorktown.

With the Loyalists, J. N. Bond came to Shelburne, Nova Scotia in 1783, later moving to Yarmouth. For about twenty years he was the only regular physician in what is now Yarmouth County. Early in 1802 he received a small packet of vaccine lymph which had been given to his brother by Dr. Jenner. Dr. Bond had invincible faith in the new discovery and tried it on his own son, an infant at the time. The results proved highly satisfactory and he at once introduced it into his practice with great success.

Despite the demands of his profession he directed much energy towards public works. He was Justice of the Peace, Judge of the Inferior Court of Common Pleas, Colonel of Militia, Collector of Customs and Sheriff. He was also one of the pioneers of Holy Trinity Church at Yarmouth where a tablet was placed to his memory.

Three sons of Joseph Norman Bond were medical doctors, two of them practising in Yarmouth. Dr. C. A. Webster in his "History of the Medical Men of Yarmouth and Conditions of the Early Days" says of the early medical men: "The breath of scandal never sullied their names, their integrity was never impeached and they did not grind the faces of the poor. They were gentlemen by birth and education and upheld the best traditions of culture in a new raw land." This company is proud to serve a profession that has made such a glorious contribution to the history of Canada and is convinced of the soundness of its policy . . . Therapeutic Exactness . . . Pharmaceutical Excellence.

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to be a step in the right direction, that is, it furnishes the student with a concise volume at a reasonable price.

Within the scope of such a book, the subject matter is well presented in an easily readable systematic manner. The chapters are short and to the point, dealing with the usual lecture material in pharmacology. Emphasis is laid throughout on the importance of experimental pharmacology as the basis of therapeutics, and most of the recent advances in pharmacology along these lines are discussed. There is a section on penicillin. The section on hormones, vitamins, and pharmacy and prescription writing, respectively, are perhaps covered at greater length than necessary, as these topics are usually considered more adequately in other courses in the medical curriculum, rather than in pharmacology.

In general, the literature is sufficiently well covered throughout, and a short bibliography completes each chapter.

Hypertension and Hypertensive Disease. W. Goldring and H. Chasis. 253 pp., illust. \$3.50. Commonwealth Fund, New York, 1944.

This book presents the results of a systematic study of the pathological physiology of hypertension, beginning with a critique of the method of estimating blood pressure and ending with chapters on treatment. It is characterized throughout by its objectivity and careful examination of current hypotheses, the most notable examples being the question of a prehypertensive phase of increased responsiveness, especially to the cold pressor test, and the problem of the renal origin of hypertension. Admitting the renal origin of hypertension in *bilateral* intrinsic renal disease, the authors are inclined to doubt the renal origin of hypertension in *unilateral* intrinsic disease on the evidence thus far presented which concerns mainly the incidence of unilateral renal disease in hypertensive patients, the incidence of hypertension in patients with unilateral intrinsic renal disease and the influence of nephrectomy in unilateral renal disease. They feel that the evidence to date is against the hypothesis that renal ischaemia is the primary etiological factor in "essential" hypertension, indicating rather that the reduction in renal blood flow in human hypertensive disease is a result of the disease rather than the cause of it. The authors accept the possibility that changes in renal metabolism may develop out of more subtle alterations in renal haemodynamics, less extensive than required to produce ischaemia, as Page and his group in Indianapolis (now in Cleveland) were able to demonstrate and do not, therefore, completely deny the possibility of a renal origin.

Along with a reduction in total blood flow, there occurs a reduction in the maximal tubular excretory capacity, calculated by presenting the kidney with overwhelming concentrations of diodrast or para-amino-hippuric acid and subtracting from the total excretion that filtered through the glomeruli. In the early stages glomerular filtration is not diminished, an increase in glomerular pressure caused by constriction of the efferent artery making possible an increased glomerular filtration from the diminished flow.

If the book has a fault it is that it tends to de-emphasize the concept of the renal origin of hypertension which, since its inception in the work of Goldblatt, has proved to be the most fruitful concept yet developed in this field even if, to be sure, the final link between animal experiments and human disease has not been forged. But this it accomplishes, paradoxically, by a masterful study of renal physiology.

Men Under Stress. R. R. Grinker and J. P. Spiegel. 484 pp. \$6.00. Blakiston Company, Toronto, 1945.

This book is primarily concerned with the experiences of the authors in dealing with psychiatric problems in Air Forces personnel in the American Army. A detailed description is given of the psychological types as found in the men under treatment and

of their reactions to combat experience. The discussion of psycho-dynamics as related to this group of patients is particularly significant because an attempt is made to correlate the anxiety situations in war with similar difficulties in adaptation as found in peace time civilian life. Of special interest are the chapters on psychiatric treatment in which emphasis is placed on psychotherapy, pharmacotherapy and convalescent care. Excellent results are reported with the use of what the authors describe as *narcosynthesis*. This is brought about by the intravenous administration of sodium pentothal which induces rapid narcosis and enables the patient to abreact his anxiety, aggressiveness and hostility, and to develop more complete insight into his condition. In summarizing the results obtained with the use of *narcosynthesis* the authors have made a signal contribution to the pressing problems of psychiatric treatment. Because of the lucid manner in which the material is presented, the numerous case history illustrations and particularly the avoidance of technical psychiatric terminology this book will have real value not only for the psychiatrist but also for the general practitioner.

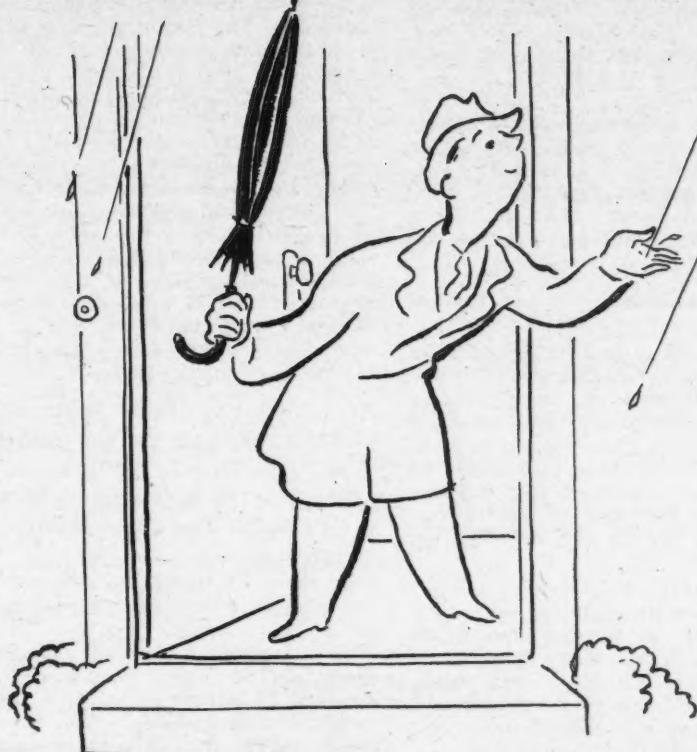
The New-born Infant, A Manual of Obstetrical Paediatrics. E. L. Stone, Associate Clinical Professor of Obstetrics and Gynaecology, School of Medicine, Yale University. 3rd ed., 314 pp. \$3.75. Lea & Febiger, Phila.; Macmillan, Toronto, 1945.

Dr. Stone states in the preface of his book that the aims of his work are to arrange in orderly fashion a mass of data scattered through a vast medical literature, and to emphasize at every opportunity the responsibility of the obstetrician. It can be truly said that his hope of making an original contribution has been realized. He has successfully bridged the gap in the care of the baby that has existed between birth and the time the paediatrician comes into the picture. Many obstetricians do not appreciate the fact that the first day (and the few days thereafter) is the most dangerous day of our lives, and only those paediatricians in charge of the nurseries of maternity hospitals are faced with the importance of the care of the new-born baby. Ordinarily, the paediatrician does not appear on the scene early enough, so that the obstetrician must shoulder the responsibility of the care of the baby, and not delegate it to the mother or attending nurse. With Dr. Stone's help, this should not be a difficult task. Almost every possible condition is dealt with from the immediate care of the new-born, down through breast and modified feeding with their associated disorders, to birth injuries, infections and disorders of the special systems. References to the literature are perhaps too carefully tabulated, and the presentation of opposing views of treatment may leave the reader confused as what is best to do, but the facts are there for his choice. All obstetricians have in this book a reference to any of the problems that they may encounter, and the paediatricians also have a great deal to learn from Dr. Stone's presentation of the normal and abnormal conditions of the new-born. Knowing the difficulties, it is a pleasure to realize that such a work has been successfully undertaken and published. All specialists and practitioners dealing with mothers and their children would do well to use Dr. Stone's book as a guide to the solution of their problems.

Primer of Electrocardiography. G. Burch, Associate Professor of Medicine, Tulane University School of Medicine and T. Winsor, Instructor in Medicine, Tulane University School of Medicine, New Orleans. 215 pp., illust. \$4.00. Lea & Febiger, Philadelphia; Macmillan, Toronto, 1945.

Electrocardiography is a subject which does not easily lend itself to a simplified form of presentation but the present volume, which does not claim to be other than a primer, covers the subject clearly and concisely. The theory of the electrical changes in the myocardium giving rise to the deflections of the electro-

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cardiogram is explained and kept to the forefront throughout the text, so that abnormal changes will be understood and not become simply a question of so much memory work on the part of the student.

The profuse use of diagrams throughout the book, instead of the usual photographic reproduction of electrocardiograms, expresses each point with great clarity. This is an excellent introduction to the study of electrocardiography.

Pulmonary Tuberculosis, A Handbook for Students and Practitioners. R. Y. Keers, Senior Physician and Medical Superintendent, Tor-na-Dee Sanatorium, and B. G. Rigden, First Assistant Medical Officer, Tor-na-Dee Sanatorium. 273 pp., illust. \$5.25. E. & S. Livingstone, Edinburgh; Macmillan, Toronto, 1945.

This book can be recommended highly to medical students and practitioners.

The subject matter of this book and its presentation should appeal to all physicians and surgeons whose interest in pulmonary tuberculosis is mainly clinical in scope. Symptoms, differential diagnosis, prognosis and after-care are dealt with in such a manner as to increase any practitioner's interest in the clinical problems of pulmonary tuberculosis. The volume clearly explains such points as the relative importance of the various procedures commonly carried out in the investigation of a case.

Under the heading, "The care of the dying patient" the authors give wise clinical and psychological advice for a period which may last for months, and which is probably a greater problem in pulmonary tuberculosis than in any other disease. Numerous well-chosen illustrations add to the value of this very readable and concise book, which presents many important principles, together with refreshingly straight viewpoints.

Radium Therapy, its Physical Aspects. C. W. Wilson, Physicist in the Department of X-Ray and Radium Therapy, Westminster Hospital. 224 pp., illust. 18s. Chapman & Hall, London, 1945.

This book published in London in 1945 presents all relevant facts concerning radium therapy.

The first two chapters deal with the properties of radium. These are set out in a clear and concise manner. In chapters three and four, the methods and apparatus for use in gamma ray dosimetry are fully explained and discussed. Chapters five, six and seven, deal with radium therapy in all its modern forms including the well-known Paterson and Parker dosage system for surface applicators and physical methods for interstitial use of radium and calculation of dosage. Radium teletherapy is fully discussed in Chapter seven. Chapter eight deals with protection against radium for people who handle radium.

This book will be of great help to the radiotherapist who has to do radium therapy as well as to the physicist interested in this line of work.

Public Health and Welfare Organization in Canada. H. M. Cassidy. 464 pp. \$4.50. Ryerson Press, Toronto, 1945.

Dr. Cassidy's book is clear, concise and factual as to the history, development and present organization of these social services in each province. The course that should be pursued in the future to avoid overlapping, waste and inefficiency in many ways is clearly indicated.

As a member of the medical profession, the reviewer is naturally most interested in the views of this author and others on so-called "health insurance" (a misnomer which should be dropped).

The value of this book would have been enhanced, it is believed, had it (1) set forth the views of organized

medicine on "health insurance". Since we of the medical profession are the custodians (in greater part) of the health of the citizens of Canada, our views on the way health services may be improved should not be ignored by those who by training or profession have little or no knowledge of the teaching and practice of medicine. The fate of the B.C. Bill in 1936 should serve as a reminder to any or all who draw blue prints for our future that this is true. (2) Had it given some estimate of the cost of all these social services (including "health insurance") which latter is only a part of the public services for which monies must be provided by any government. The members of the medical profession are interested both as tax payers and doctors.

As organized medicine has been studying the problem of health insurance for years, we welcome (even if we do not agree with) the views of laymen and so the findings and opinions of this distinguished writer and student of social affairs as presented in this volume should be carefully studied by all members of the profession whether they be public health officials, teachers or practitioners.

Technical Methods for the Technician. A. L. Brown, M.D., Director of Dr. Brown's Clinical Laboratory, 3rd ed., 706 pp., illust. \$10.00. Published by the author, 327 East State Street, Columbus, Ohio, 1944.

This volume having now reached its third edition in four years, obviously fills a need. Like most books of the kind it is specially adapted to the requirements of the school of technicians for which it was published. It is written in a chatty style with numerous practical hints for the benefit of the student and a number of excellent aphorisms culled from classic writers and the author's own lectures. We have found the volume useful in our own laboratory and shall recommend it to budding technicians. One criticism which can be made is that the space devoted to tissue work is too small in proportion to the other departments of the work, only five pages with a two page classification of tumours. We would suggest that in future editions this section of the book be expanded, giving alternative methods of fixing, staining and embedding.

Textbook of Neuropathology. A. Weil, Associate Professor of Neuropathology, Northwestern University Medical School. 2nd ed., 356 pp., illust. \$5.50. Grun & Stratton, New York, 1945.

The ideal of a former generation that the neurologist should be his own critic at the autopsy table and at the microscope has become difficult to realize in the present age. An adequate understanding of neuropathology today entails a background of clinical neurology and an appreciation of the constant changes during life and post-mortem in the histological makeup of the brain and the influence of these changes on the appearance of pathological tissues, as well as a balanced view of the effect of vitamin deficiencies, sulfonamides or shock. Professor Weil appears to have this wide outlook. He succeeds in combining the technical standpoint of laboratory with the broader biological aspect of the clinic. The text includes detailed neuro-anatomical and histopathological descriptions of every aspect of disease of the nervous system. These are supplemented with valuable chemical and physico-chemical data. Separate sections of the book describe the technique of post-mortem examination of the brain and the standard methods of fixation and staining. The second edition has been revised in the light of experimental and clinical investigations of the past decade. The illustrations are plentiful and well-chosen, but very dull to study. Some halcyon day in the future it will be mandatory to print all pathological illustrations in full colour. In spite of this shortcoming, which is no fault of the author, the book is highly recommended.

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BOOKS RECEIVED

Cortex of Galago. G. von Bonin, Professor of Anatomy, University of Illinois. 55 pp., illust. \$1.50. The University of Illinois Press, Urbana, Illinois, 1945.

Local Health Units for the Nation. H. Emerson, Chairman, Subcommittee on Local Health Units, American Public Health Association. 332 pp., illust. \$1.25. Commonwealth Fund, New York, 1945.

Savill's System of Clinical Medicine. Edited by E. C. Warner. 12th ed., 1168 pp., illust. \$9.00. Edward Arnold & Co., London; Macmillan, Toronto, 1945.

British Encyclopaedia of Medical Practice, Medical Progress 1945. 396 pp. \$10.00. Butterworth & Co., Toronto, 1945.

British Encyclopædia of Medical Practice, Cumulative Supplement, 1945. 256 pp. Butterworth & Co., Toronto, 1945.

Tuberculosis in the United States. Graphic Presentation. Volume 3. Prepared by the staff of the Field Studies Section of the Tuberculosis Control Division, U.S. Public Health Service. Medical Research Committee, National Tuberculosis Association, 1945.

Autonomic Nervous System. A. Kuntz, Professor of Micro-Anatomy in St. Louis University School of Medicine. 3rd ed., 687 pp., illust. \$9.75. Lea & Febiger, Phila.; Macmillans, Toronto, 1945.

Clinics, Vol. IV, No. 2. Edited by G. M. Piersol, Professor of Medicine, Graduate School of Medicine, University of Pennsylvania, Phila. 354 pp., illust. J. B. Lippincott, 1945.

Das Herz Beim Scharlach. B. Steinmann, Sekundararzt der Medizinischen Universitätsklinik, Bern. 149 pp., illust. Fr. 12.80. Verlag Hans Huber, Bern, 1945.

Neuro-Anatomy. A. Kuntz, Professor of Micro-Anatomy in St. Louis University School of Medicine. 4th ed., 478 pp., illust. \$7.50. Lea & Febiger, Phila.; Macmillans, Toronto, 1945.

Structure and Function of the Human Body. R. N. Baillif, Assistant Professor of Anatomy, Louisiana State University School of Medicine, New Orleans, and D. L. Kimmel, Associate Professor of Anatomy, Temple University School of Medicine, Philadelphia. 328 pp., illust. \$3.50. J. B. Lippincott, 1945.

Textbook of Surgery. J. Homans, Clinical Professor of Surgery, Emeritus. 6th. ed., 1278 pp., illust. \$10.75. Charles C. Thomas, Springfield, Ill.; Ryerson Press, Toronto, 1945.

What People Are. A Study of Normal Young Men. C. W. Heath, with L. Brouha, L. W. Gregory, C. C. Seltzer, F. L. Wells, and W. L. Woods. 141 pp., illust. \$2.00. Harvard University Press, Cambridge, Mass., 1945.

Bionergetics and Growth. S. Brody, Chairman, Committee on Growth and Energy Metabolism, College of Agriculture, University of Missouri, Columbia, Mo. 1023 pp., illust. \$8.50. Reinhold Publishing Corporation, New York, 1945.

Clinics, Vol. IV, No. 3. Edited by G. M. Piersol, Professor of Medicine, Graduate School of Medicine, University of Pennsylvania, Philadelphia. 285 pp., illust. J. B. Lippincott, Montreal, 1945.

The Extremities. D. P. Quiring, Head of the Anatomy Division, Cleveland Clinic Foundation; B. A. Boyle, Artist, Cleveland Clinic Foundation; E. L. Boroush, Fellow, Anatomy Division, Cleveland Clinic Foundation; B. Lufkin, Former Secretary Research Division, Cleveland Clinic Foundation. 117 pp., illust. \$3.15. Lea & Febiger, Philadelphia; Macmillan Company of Canada Limited, Toronto, 1945.

Fires in Hospitals and Institutions. 48 pp. \$0.50. National Fire Protection Association, Boston, 1945.

Handbook of Diagnosis and Treatment of Venereal Diseases. A. E. W. McLachlan, Consultant in Venereal Diseases, City and County of Bristol. 2nd ed., 371 pp., illust. \$4.50. E. & S. Livingstone Ltd., Edinburgh; Macmillan Co. of Canada, Toronto, 1945.

Krotki Słownik Lekarski Angielsko-Polski (Short Anglo-Polish Medical Dictionary). W. Tomaszewski, Polish School of Medicine at the University of Edinburgh. 168 pp. \$2.50. E. & S. Livingstone Ltd., Edinburgh; Macmillan Company of Canada, Toronto, 1945.

Modern Treatment Year Book 1945. Edited by C. P. G. Wakeley, Fellow of King's College, London. 300 pp., illust. \$4.50. The Medical Press and Circular, London; Macmillan Company of Canada Limited, Toronto, 1945.

Public Health Nursing in Canada. F. H. M. Emory, Associate Director, School of Nursing, University of Toronto. 554 pp. \$3.00. Macmillan Company of Canada, Limited, Toronto, 1945.

Transactions of the American Association of Genito-Urinary Surgeons. Vol. XXXVII, Fifty-sixth Annual Meeting held at Stockbridge, Mass., June 8, 9, and 10, 1944. 315 pp., illust. The Bruce Publishing Company, St. Paul and Minneapolis, 1945.

DR. GUILLOTIN.—Joseph Ignace Guillotin was born at Saintes (Charente Inférieure) in 1738, and after serving as professor of literature at the Irish College at Bordeaux, studied medicine at Rheims, where he qualified in 1768, and two years later obtained a doctor's degree in Paris. He subsequently acquired some distinction in the capital, as he served on a committee appointed by the Government to inquire into Mesmer's exhibitions, and was made one of the ten deputies of Paris in the Assemblée Constituante. On October 10, 1789, he made a proposal to this body that there should be a uniform method of execution, by decapitation, in place of the barbarous methods hitherto employed, such as burning, mutilation, drowning, and hanging. The Assembly however, was moved to laughter when he claimed that a machine which he had invented caused an immediate and painless separation of the head from the trunk, and it was not until two years later that a law was passed that everyone condemned to death should be decapitated. The instrument was at first called "la petite Louison", or "la Louisette", before the name "guillotine" was finally substituted. Dr. Rolleston suggested that the legend that Guillotin was one of the first to perish by the machine to which his name was given rested on the fact that Fouquier Tinville had him thrown into prison on discovery of a letter from a Count Méré about to be executed, commanding his wife and children to the doctor's care. Guillotin, however, was subsequently released on the fall of Robespierre, and lived until 1814, when his death was due to a carbuncle of the left shoulder. It is noteworthy that Guillotin was one of the earliest French supporters of Jenner's discovery, and in 1805 was made president of a comité de vaccin in Paris.—*Brit. M. J.*, 2: 1931.